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COMPUTERWORLD

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OS/2, Unix facing net clash

Server strategies straddle fence while technical issues are resolved

BY ELISABETH HORWITT and JOANIE M. WEXLER
CW STAFF

They are just starting to square off now, but within a year or two, OS/2 and Unix should be engaged in a head-to-head struggle for control of Fortune 500 companies' local-area network server budgets.

Personal computer LAN products represented a $4.6 billion market worldwide in 1989, according to a recent report by Salomon Brothers, Inc. That total is projected to grow 21% this year, with high-end server and operating system sales making up the bulk of the growth.

The 21-year-old Unix operating system seems to command a strong technical position today as a far more mature operating system with the built-in networking and maintenance utilities that 2-year-old OS/2 lacks. But several users said they expect OS/2 to catch up with Unix in most key areas within a year or two — when many companies will still be in the evaluation stage of their long-term network server strategies.

World Bank, for example, hopes to put together within a few years an "architectural framework for computing and communications," which will probably include both OS/2 and Unix, according to senior research officer David Delmonte.

Currently, the bank uses Unix-based servers from Banyan Systems, Inc., but "it would be premature for us to move wholesale" into any kind of corporatewide server architecture, Delmonte said. He cited the current immature state of key technologies in both the Unix and OS/2 worlds, including LAN management, shared SQL

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Covia eyeing tiered LANs

BY ELISABETH HORWITT
CW STAFF

ENGLEWOOD, Colo. — Covia Partnership effectively issued a testimonial to OS/2's viability as a server architecture recently by deciding to make OS/2 and LAN Manager the basis for the server platform it developed to serve its airport and travel agency users.

But while Covia has concluded that OS/2 has the power and networking support to serve high-end local-area network systems of 1,000 stations or more, the airline service firm is leaning toward Unix when it comes to implementing the crucial next stage of its server strategy.

Covia is looking to cut costs and provide more efficient use of computing resources, both for itself and its airport and travel agency clients, through powerful hubs that will supply the application, data and interconnectivity needs of entire regions, said Covia Chief Information Officer and Vice-President Mark Teflian.

In this instance, a "region" could be a group of travel agents

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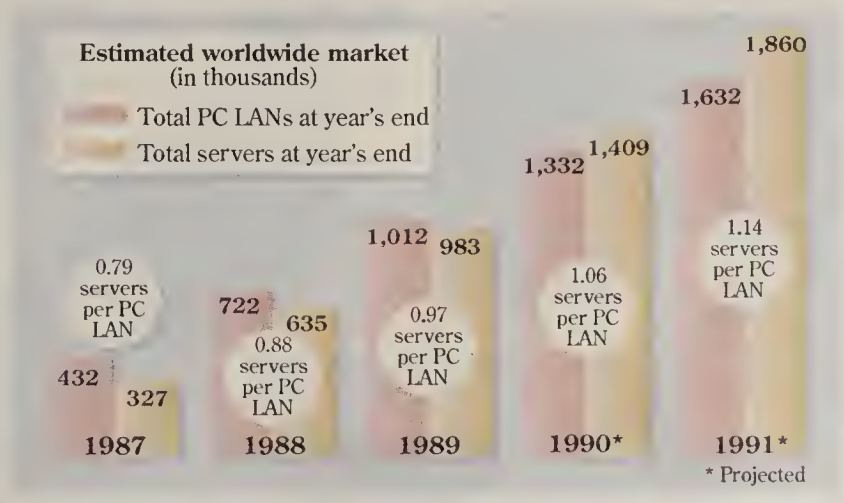
At the hub

Demand for larger LANs is spurring increased sales of LAN servers



Source: Salomon Brothers, Inc.; International Data Corp. CW Chart: John York

PS/2 tries to climb off desktop

BY RICHARD PASTORE
CW STAFF

NEW YORK — IBM, which has been eating dust in the file server race, hopes to gain ground with six new Personal System/2 models introduced last week.

The models range from two entry-level Model 65 SXs to four improved Model 80s, IBM's most powerful PS/2s to date (see chart page 8). The boxes will support up to 254 nodes when running IBM's LAN Server 1.2 software. However, the 65 SX is better suited for less computing-intensive local-area networks, while the Model 80 is the family's workhorse.

All of the systems feature the small computer systems interface, which allows attachment of up to seven peripheral devices per SCSI board. This is a key new strategy that may make its server offerings more attractive and competitive, observers said.

"Being able to put multiple drives on a server creates more flexible options for the user," according to Bruce Stephen, an analyst at market research firm

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Lax security invites liability nightmare

Third in a four-part series

BY MICHAEL ALEXANDER
CW STAFF

A year ago this month, an oil tanker ripped open its hull on a reef, gushing millions of gallons of black crude into Alaska's Prince William Sound. The ship's captain faced criminal charges in the aftermath of the spill.

There are lessons to be learned from the Alaskan disaster that information systems managers would do well to heed lest, like the captain of the grounded tanker, they be hauled into court, according to several computer security professionals and legal experts. The charge? Failure to adequately protect their corporate computer systems against hacker attacks, viruses and other serious breaches of security.

"Corporate and governmental computer systems are like the *Exxon Valdez* — unprotected, under inadequate leadership control, operating through dangerous channels and loaded with valuable and messy stuff," said Sanford Sherizen, president of Data Security Systems, Inc., a computer-crime prevention firm based in Natick, Mass.

David Flaherty

"Corporate exposure and vulnerability has outstripped the rate of acceptance and proliferation of computer systems and networks," said Kenneth Weiss, chief technical officer at Security Dynamics, Inc. and chairman of the computer security division of the American Defense Preparedness Association. "If [senior management] really understood the potential liability and the potential risks to corporate assets and to their reputations, they might shut down all networks and computer centers."

Although there are few absolute IS security standards now in place, "we are moving to an era of mandatory data security," Sherizen said. "Computer crime laws and regulatory requirements, new auditing perspectives, insurability

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NEWSPAPER

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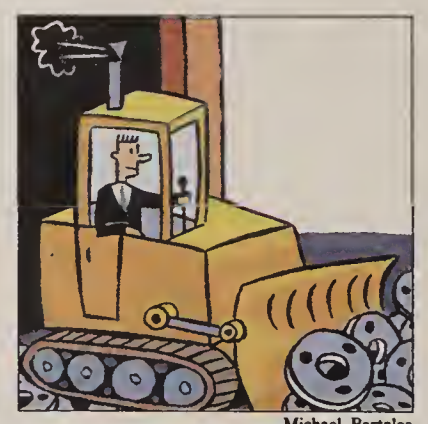
The firms that will make it in the '90s are those that focus on what they do best and outsource the rest, according to an article in the latest *Harvard Business Review.* The report results from a three-year study that measures technology's impact on the service sector. Outstanding examples: Toys 'R Us thrives by knowing so much about the toy market that it even directs its own suppliers' production plans. Apple made it big by farming out everything from hardware to marketing and focusing its own energies on innovation. Honda built its automotive empire by building great engines and outsourcing non-engine fabrication work.



Michael Bartalos

Converting obsolete IS systems may require pulling out the heavy equipment. Page 97.

Tim Lewis

There are high-fliers and ground-dwellers in the world of EDI. Page 81.

EXECUTIVE BRIEFING

■ **Between the EDI proponents and naysayers,** there may not seem to be a middle ground. But implementing EDI does not have to be an all-or-nothing effort. Some companies are using a personal computer-based setup to keep it small; others are going whole-hog, paying bills electronically and transmitting other data beyond ordering and invoicing, such as bar-coding and CAD/CAM. Be warned that there is a lot of homework involved. Get to know your firm's requirements, network needs, commercial software offerings and the services of the third-party providers. **Page 81.**

■ **The choice may be between OS/2 and Unix,** and if you are an IS manager who wants to know which is better suited for a networked environment, the answer is unclear. Interviews with users and consultants show that Unix holds an edge over OS/2 as the platform of choice for servers, but that OS/2 is likely to close the gap and make it a real horse race during the next couple of years as developers in both worlds flesh out their network capabilities. IBM tried to fill in some missing pieces last week when it announced that OS/2 Extended Edition Version 1.2 and LAN Server will ship this week. IBM also introduced a batch of new Personal System/2 models, including some designed to be servers. **Stories pages 1, 8 and 128.**

■ **This decade is going to hurt,** according to a poll of 112 senior IS executives questioned by Arthur D. Little, Inc. The managers said they expect "high" to "excruciating" levels of pain as their companies transform the way they use information and do business during the next decade. **Page 73.**

■ **Everyone is talking about globalization** and its role in the business world of the 1990s. For one business segment — electronics — globalization means that organizations will not only be looking for worldwide market opportunities, but also for competition and capital. **Page 105.**

■ **There has been another security breach** on the Internet network, which was victimized by a worm program more than a year ago. This time a hacker tried to show up some of the computer experts who have criticized hackers and virus-mongers. **Page 127.** Meanwhile, the specter of criminal charges may come to haunt information systems managers who fail to secure their systems against viruses, hackers and other threats. Security experts say that a serious computer problem that causes a company to go bankrupt or harms employees could leave the IS manager holding the bag. **Page 1.**

■ **Merger mania has altered the lives of numerous IS professionals,** but in California, there is an IS organization that has had to sit and watch a system die a painful death because of the lack of a merger. San Diego Gas & Electric Co.'s plans for a new energy control system have been on hold for two years because a proposed merger has been frozen. **Page 29.**

■ **On-site this week:** Northwest Airlines hopes to empty a gymnasium-size room of maintenance documents with the help of an online system. **Page 29.** A PC-driven bar-code system helps to move legal papers through the Missouri courts. **Page 55.** The University of Massachusetts at Amherst hopes to take MIT's Project Athena a step further under Project Pilgrim. **Page 72.**The decennial U.S. census got under way last week, and the computerized tools that the Census Bureau is using are a far cry from the quill pens of the first headcount back in 1790. **Page 4.**

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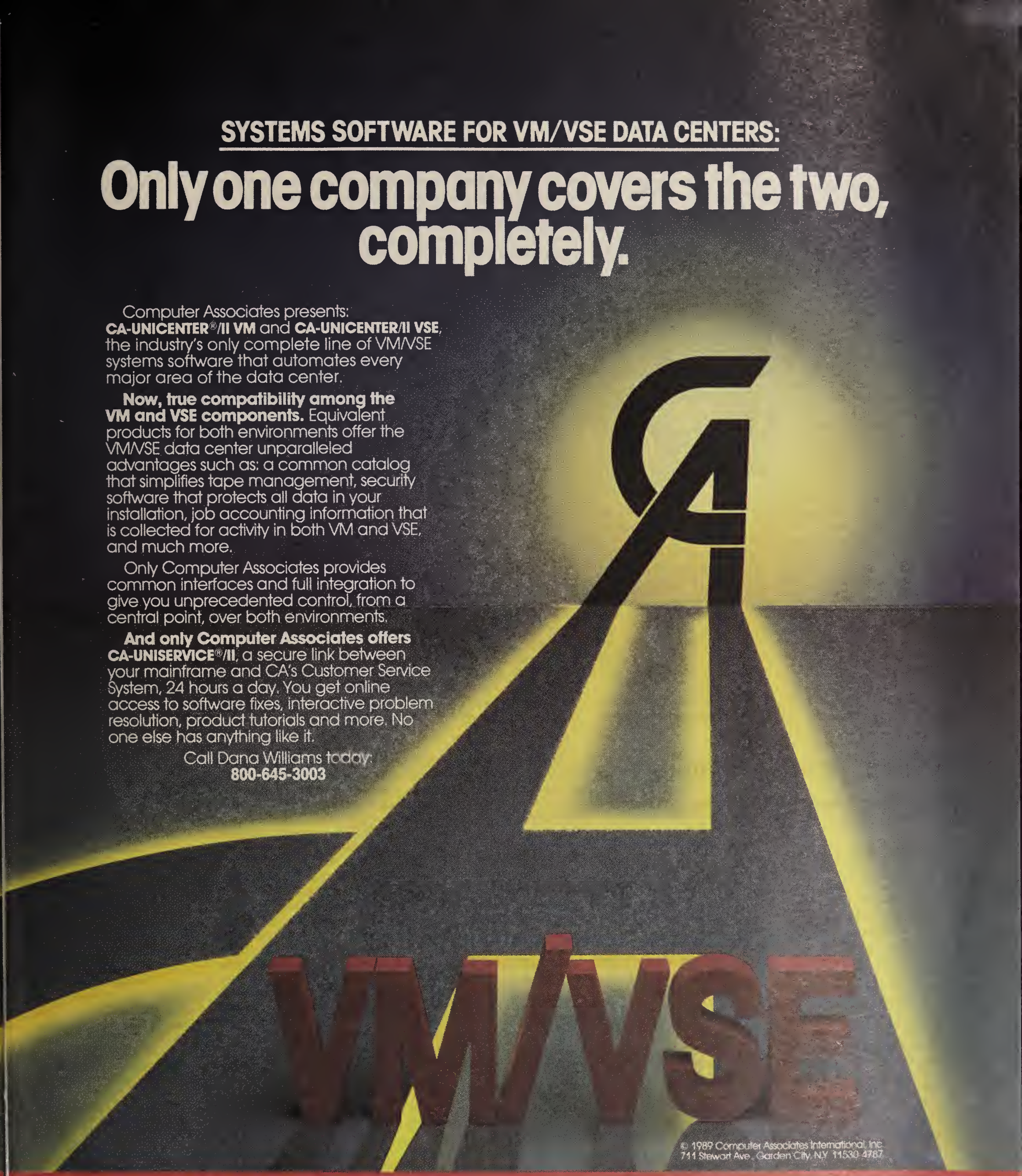

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Computerized tally dillydally

Standard for voting systems integrity is much too wishy-washy, experts say

BY MITCH BETTS
CW STAFF

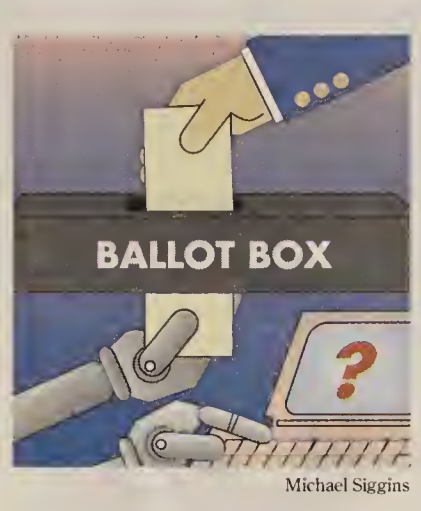
WASHINGTON, D.C. — Several computer scientists have sharply criticized a new technical standard for computerized vote-counting systems and argued that tougher standards are needed to ensure the accuracy of U.S. vote tallies.

Critics said the standard, approved by the Federal Election Commission (FEC), is deficient in the areas of software testing, programming languages and computer security.

"The result is a gossamer standard, so thin and flimsy that it will do little to improve the security and integrity of electronic elections," according to a critique by Howard Jay Strauss, a Princeton University computer scientist and member of a citizens' group called Election Watch.

The controversy concerns a voluntary standard written by the FEC's National Clearinghouse on Election Administration for use by state and local election officials [CW, Jan. 29]. The standard calls for certification of computer systems by independent testing authorities, audit trails and placement of vote-counting software in escrow so it can be checked in disputed elections.

"It's a good start, but I'm disappointed with the standard in several areas," said Roy J. Saltman, a computer scientist at the National Institute of Standards



Michael Siggins

and Technology and the federal government's top expert on voting systems.

Saltman and Election Watch cited the following deficiencies:

- The use of high-order programming languages, such as Cobol, C and Ada, is suggested but is not mandatory. Experts said it is difficult to spot hidden code in the assembler language now used in vote-counting software programs.
- The use of dedicated systems for vote counting also is suggested but not mandated. Using a computer dedicated only to vote-counting prevents the software from being contaminated or altered by other computer programs running on the same system.
- Much of the standard relies on the vendors of voting systems to ensure computer security. For example, vendors are to perform the penetration analysis on their own systems and send the results to the testing authority, but not to the election administrators.

"What's the whole point [of independent certification] if you're going to accept the word of vendors?" Saltman said.

- The standard allows the continued use of prescored punch card ballots, which are notorious for having the chad fall out during handling and processing.

"In most places, the standard accepts the status quo. In others, it artfully protects vendors from any real change," Strauss said.

Robert J. Naegele, a San Jose, Calif.-based consultant who wrote early drafts of the standard, said he is not happy with the final product. He said that the approved standard is poorly organized, lacks technical clarity and should have made dedicated systems and high-order programming languages mandatory for new voting systems.

In defense of the standard, Penelope S. Bonsall, director of the FEC clearinghouse, said it is the result of pragmatic compromises between the interests of computer specialists, state and local election officials and vendors.

For example, she agreed that dedicated systems for vote tabulation are ideal from the point of view of "computer security purists," but many small jurisdictions do not have the funds for dedicated systems.

Bonsall said that high-order programming languages were not required because of the cost of rewriting the software for little benefit. She added that outlawing prescored punch cards or regulating the voting machine industry is beyond the FEC's authority.

Bonsall defended the decision to prevent users from obtaining the vendor's system-penetration analysis on grounds that public disclosure would show hackers where the system is vulnerable.

"That's ridiculous," Saltman countered. "If there are vulnerabilities, the jurisdictions should know about it." They could keep the analysis out of public hands, he said.

The next step in the process is accreditation of the independent testing laboratories. "They don't have any money for that," Saltman said. "Let's hope they find some."

U.S. computer technology finally comes to its census

BY GARY H. ANTHES
CW STAFF

The U.S. Bureau of the Census, which kicked off the 1990 census by mailing questionnaires to millions of American households last week, is counting on an array of new computer technologies to make the $2.5 billion count more accurate and timely.

The bureau will also publish its results in a format intended to make machine-readable census data widely available to cost-conscious individuals and small businesses for the first time.

The Census Bureau seems to mark major progress in 100-year increments. For the first U.S. census, conducted in 1790, some 650 assistant U.S. marshals counted four million Americans at a cost of $44,000. The technological underpinnings included horses and quill pens.

For the 1890 count, census engineer Herman Hollerith developed an automatic card-punching machine, which vastly accelerated the processing. Hollerith later left the Census Bureau to start a company that eventually became IBM.

This century, quill pens and punched cards are out. The monumental task of counting 250 million U.S. citizens is backed by 530 Digital Equipment Corp. VAXs, 6,900 terminals, 74 custom-built high-speed cameras for turning census forms into microfilm, several Unisys Corp. mainframes for number-crunching and reporting and a gaggle of output devices for preparing gigabytes of data for the public.

The agency said it will interview 2.2 million people for 480,000 temporary jobs, boosting its staff to more than 50 times the usual number.

The Constitution requires a census to be taken at least once every 10 years, and subsequent legislation has put a variety of reporting demands on the Census Bureau.

To help it meet these escalating requirements, the bureau will unveil several new automated aids this year. Chief among them is the $300 million TIGER system.

The Topologically Integrated Geographic Encoding and Referencing system replaces the error-prone method of preparing maps manually. In 1980, many thousands of map sheets — used by an army of field enumerators — were laboriously prepared, coded, corrected and distributed. Many turned out to be illegible and incorrect [CW, June 12].

Now, electrostatic plotters in regional offices are printing 1.7 million unique map sheets from a digital cartographic database supplied by the U.S. Geological Survey, with features such as roads annotated or labeled by the Census Bureau. Between now and the census of the year 2000, the agency will continue to update the database and will sell its map data to the public.

Another bottleneck in previous counts has been at the front end of the enormous data-capture exercise. The process of logging in census forms and then determining which were missing was largely a manual one. This year, each form will bear a bar code identifying the address to which it is mailed.

In another improvement, Census Bureau programmers have added "smart" software that is able to assign codes to text that is entered from those few portions of the census forms that allow handwritten entries.

For example, a spokeswoman for the bureau said, American Indians are asked to write in the names of their tribes. Edit programs will then assign codes to the tribe names, facilitating processing and reporting.

The processing of census data has been greatly decentralized for the 1990 count. The district offices previously relied entirely on manual processing of incoming census forms. Now, the district offices have DEC Microvax 3500s connected to devices for scanning the bar codes. The new procedures should get data into the system months earlier, census officials said.

For the 1980 census, the Census Bureau published some 900 reports on paper and sold the 5.5 gigabytes of supporting data on magnetic tapes. Starting with this census, the agency will sell its data on compact disc/read-only memory disks for systems as small as personal computers.

The Census Bureau predicted that printed output of all the 1990 census data would fill some 420,000 pages, or 62 feet of shelf space. The official report from the first U.S. census 200 years ago was 56 pages.

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Closing Arguments

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NEWS SHORTS

Now it's enterprise licensing

Informix Software, Inc. will let corporations buy enterprisewide licenses for its Wingz spreadsheet and Smartware II office automation software packages. The move follows Microsoft Corp.'s introduction of site-licensing for some of its products, including the Excel spreadsheet, which competes with Wingz. "This goes beyond a site license," said David Frankland, director of channel marketing at Informix. "We don't want to put any geographic limitation on it." Customers can buy documentation in lots of 25 and distribute the software to 250 or more users. Frankland said Liberty Mutual Insurance Co. has purchased an enterprisewide license for Wingz.

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Store-and-forward advances

Compuserve, Inc. said last week that it had interconnected its electronic mail system with Action Technologies, Inc.'s Message Handling Service (MHS), a message management and handling system supported by some two-dozen software vendors. Compuserve said the interconnection will allow the 553,000 members of the Compuserve Information Service to link with the 750,000 users of MHS-compatible local-area network mail systems. Action also announced an agreement under which Ashton-Tate Corp. will license MHS for its Framework III and Multimate 4.0 software.

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Sharp adds notebook computer

Sharp Corp. last week introduced the PC-6220, its new four-pound notebook personal computer. The PC runs on a 12-MHz Intel Corp. 80C286 microprocessor and has a 24-line LCD screen with IBM Video Graphics Array emulation and a triple supertwist display. The system comes with 1M byte of random-access memory, expandable to 3M bytes. It is equipped with a 2½-in., 20M-byte hard disk. The Sharp laptop does not have a floppy disk drive, but an optional 3½-in. floppy disk can be attached. It was also designed to be converted into an IBM Personal Computer AT-compatible desktop system. Sharp said the PC will retail for less than $4,000.

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CA adds on-line access

Computer Associates International, Inc. last week took steps toward burnishing its lackluster service and support reputation by announcing a no-cost, on-line service for accessing temporary program fixes and product information bulletins. The new service, called CA-PTFAID, will allow companies with CA software maintenance agreements to dial into CA's customer service system via a dial-up terminal or PC and review fixes and product information bulletins.

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Farallon connector down pat

A U.S. patent for the connector that reportedly first allowed users to network computers over existing telephone wires was recently awarded to Farallon Computing, Inc. The company said it is interested in negotiating licensing agreements to third-party manufacturers of connecting devices.

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Symbolics unwraps HDTV box

Chalk one up for the U.S. in the high-definition television contest. Symbolics, Inc. last week unveiled what it said will be the first commercially available high-definition videographics processor, called Flame Thrower. The firm also announced a high-definition videographics workstation. The technology does not come cheaply: The processor sells for $23,900, and the workstation costs $58,000. Both are expected to ship in June.

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Contel wins Tass pact

The Contel ASC subsidiary of Contel Corp. last week won a $3 million contract from Tass, the Soviet news agency, to provide a satellite-based network. Tass will use the private network to exchange news dispatches with bureaus inside the USSR and abroad. The network will support data broadcast and two-way exchanges of data, facsimile and voice at 9.6K bit/sec., 10 times faster than with the existing system, Contel said.

More news shorts on page 126

Boeing exec fills Microsoft pilot seat

Boeing Computer's Hallman to replace retiring President Shirley

BY CHARLES VON SIMSON
CW STAFF

REDMOND, Wash. — Ending an executive search with a broad focus outside the personal computer segment of the industry, Microsoft Corp. last week tapped the president of Boeing Computer Services as its No. 2 executive.

Michael R. Hallman will join Microsoft as president April 2, replacing retiring President Jon A. Shirley. He brings to the job 25 years of experience gained at both Boeing and IBM in selling into large corporate computer accounts. That experience may prove critical as Microsoft struggles for the acceptance of OS/2.

"We needed someone with big-company experience, and there are not a lot of billion-dollar companies in the PC business," said Shirley, who will leave his position June 30. In light of Microsoft Chairman Bill Gates' profile, Shirley said, "we didn't need a big name."

Hallman, 44, became president of Boeing Computer Services in November 1987 and was responsible for all Boeing computing and communications systems, managing an inventory with an estimated value of $1.3 billion, including 43,000 PCs.

Prior to joining Boeing, Hallman spent 20 years in various

Hallman *to take Microsoft's second spot in April*

marketing positions at IBM, most recently as vice-president of field operations, responsible for all sales and marketing support for the company's Southwest marketing division.

He is likely to continue in Shirley's role of playing the inside man to Gates' strong outside presence. "Why change what has been a successful formula?" Shirley asked. "While we are not the same person, and there will be differences, Mike has depth in similar areas."

Executives who know Hallman said he made his reputation at IBM as an effective salesman in the lucrative General Motors Corp. account in the mid-1970s. He moved through several prominent positions in the firm but failed to gain the presidency of the Southwest marketing division. At that point, he went to Boeing and served as the deputy to the former Boeing Computer Services President Robert Dryden, who went on to a senior general management position at the aerospace giant, leaving the job to Hallman.

Hallman is an able operations manager and aggressive marketer, according to several sources, continuing in the model of Shirley. "Much in the same way as Shirley, Hallman's business and sales strengths will play to Gates' creative strengths," said Sam Albert, a 30-year IBM executive and now president of Sam Albert Associates, a Scarsdale, N.Y., market research and publishing firm.

Lotus juggles company structure

BY MAURA J. HARRINGTON
CW STAFF

In an effort to focus its sales and marketing efforts more clearly, officials at Lotus Development Corp. announced last week that the firm has reorganized the company and entered the software consulting business.

The new company structure decentralizes operations into four independent business units: the Software Business Group, the International Business Group, the Information Services Group and the Consulting Services Group, according to the company.

The changes increase Frank King's already significant role in the company. King is now senior vice-president of the Software Business Group. Formerly the senior vice-president of the now-defunct Software Products Group for 1½ years, King's now has the responsibility for development of the North American Sales Division, to be headed by William Drummey, on top of his original work load. Drummey will report to King.

"I think King has quickly become an important part of this company . . . He's had a lot of impact on the organization," said analyst Chris Mortenson, who works in the New York office of Alex Brown & Sons, Inc., a market research company based in Baltimore.

Lotus' newly formed Consulting Services Group will be headed by Frank Moss.

Moss, who was previously vice-president of the Networked Applications Systems Division, will now head the group that integrates Lotus and third-party software products for Lotus' clients, as the vice-president of the Consulting Services Group.

"Basically, we will start the consulting group off as a North American business, and over time we'll expand," said Robert Schechter, senior vice-president and chief financial officer, who will also take over responsibility for a unified customer support and services function under the reorganization.

Visa processing centers under construction

BY JIM NASH
CW STAFF

Visa International last week announced the construction of a new transaction processing center for Asian/Pacific business and an expansion of its existing processing center in Virginia.

Construction has already begun on the center in Yokohama, Japan. It will become the fourth transaction processing center in the Visanet Delivery System, Visa's international network of computers that authorize purchases as well as clear and settle accounts. The three existing sites are based in London, McLean, Va., and San Mateo, Calif.

Mike Massey, vice-president of Visanet operations, said the facility will be equipped with two IBM 4381s for processing transactions in 17 Asian and Pacific nations. The other three facilities run a combination of systems, including the more powerful IBM 3090.

When fully operational in the fourth quarter of 1990, the Yokohama facility will handle the 200 million transactions that occur every year in the region.

At the same time, Visa is tripling the size of its information systems center in McLean. The firm said it expects to break ground on the 60,000 square-foot annex in August. All IS equipment will be transferred to the annex beginning in October 1991.

Neil Waldo, senior vice-president of Visanet, said the McLean plant is quickly reaching capacity.

Software with a foreign flair

Vendors show multilingual-function software at Cebit '90

HANNOVER, West Germany — Software packages featuring multilingual functions were among the products introduced last week in an attempt to capitalize on the international flavor of Cebit '90, the massive information systems and telecommunications conference.

The following, compiled from IDG News Service reports, is a summary of Cebit highlights.

■

Banyan Systems, Inc. is hoping to cross a variety of cultural divides with Version 4.0 of its Virtual Networking Software (Vines) network operating system, which includes the capability to work in several languages.

Support for English, French (both Canadian and Parisian) and German are included in Vines Version 4.0, which began shipping in Europe this week. Spanish and Norwegian support will be added by the third quarter. Other languages will be added as the translation work, which is carried out by Banyan's distributors using tools provided by the company, progresses.

Multilingual Vines presents all menus, Help screens and prompts to the user in his native language. Any system information in a message sent via Vines to another user is automatically translated into the recipient's language. The operating system can adjust to different time zones and daylight savings time.

■

Horst Nasko, chairman of the board of **Nixdorf Computer AG,** said the merged data and information technology activities of both companies into **Siemens-Nixdorf Informationssysteme AG** is expected to become operational as of Oct. 1.

The structural integration of the companies will not be decided until after West Germany's Federal Cartel Office approves Siemens AG's purchase of Nixdorf, Nasko said. According to Nasko, the approval is not expected before May 17.

Regarding layoffs, Nasko confirmed that 4,000 jobs in research and development, manufacturing and sales will be eliminated worldwide, dropping the number of employees from 28,000 to 24,000.

■

Microlytics, Inc., a manufacturer of linguistic and reference software products, introduced Multitrans, a multiple-language software program for IBM Personal Computers and compatibles that allows users to translate words and phrases between English, French and German. The system allows translation to and from any two languages available.

According to the firm, when a user requests translation for a particular word, a window opens to reveal a set of alternatives. Users can then choose the most appropriate word or phrase in its literal translation. Optional languages, such as Spanish, Italian and Dutch, can be added.

Available in two versions, Multitrans and Multitrans Professional, the program supports all major word processing programs. Multitrans features 20,000 words for translation and Multitrans Professional offers 40,000. Microlytics is currently seeking European distribution for Multitrans, which will begin shipping in May.

■

Faced with the political liberalization of Eastern Europe and the significance of the European market as an alternative to the saturated U.S. market, U.S. firms have flocked to this year's technological labyrinth, which runs until March 28.

Headed by **Apple Computer, Inc.**, **IBM**, **Digital Equipment Corp.** and **Hewlett-Packard Co.**, the U.S. contingent included 312 exhibitors. Sprawling over more than 361,000 square meters of exhibition space, 36,000 more than in 1989, Cebit '90 drew 4,000 exhibitors, up from 3,214 last year, representing 41 countries; West German companies produced 2,470 exhibitors, followed by the U.S. and by Taiwan's 210 exhibits.

■

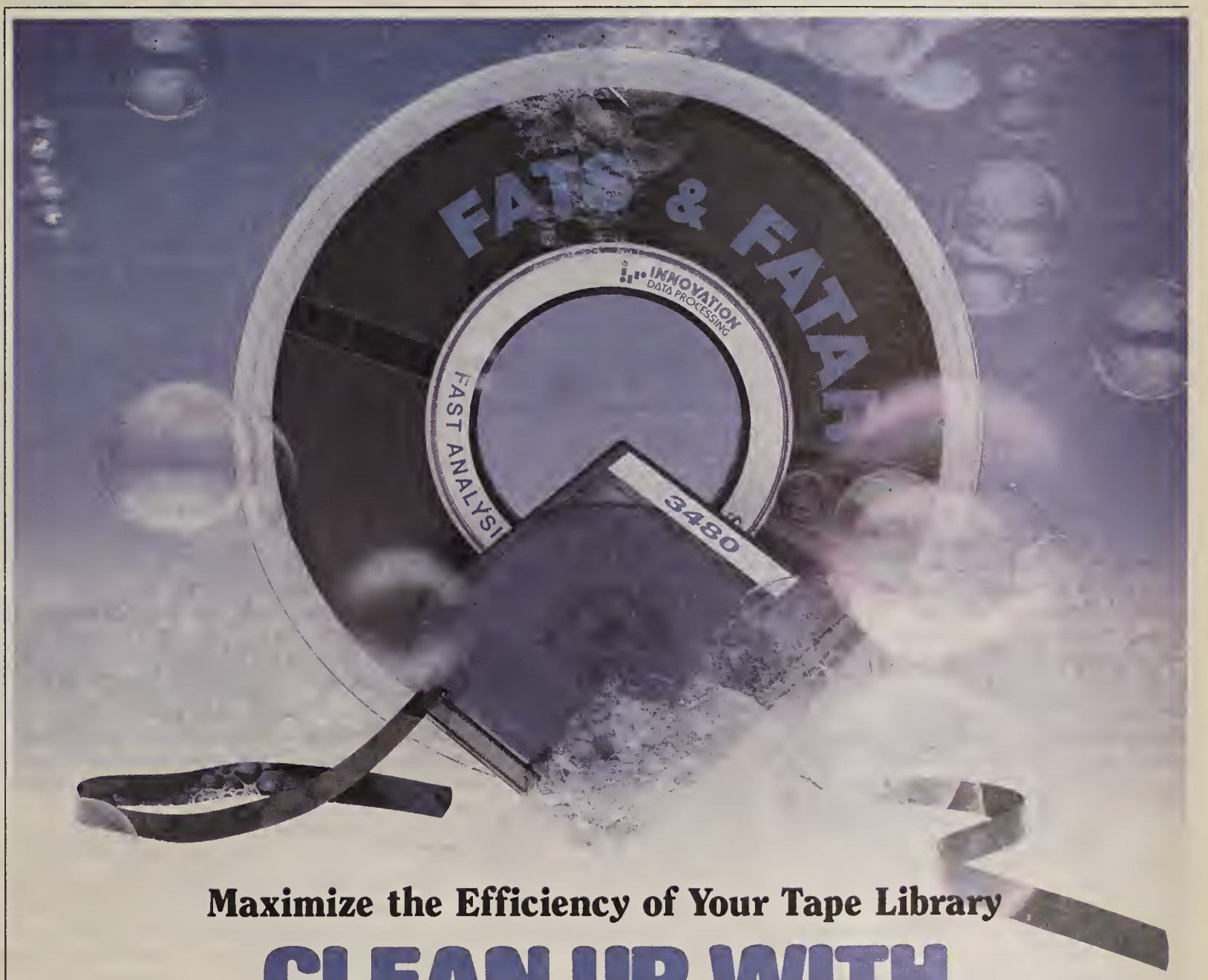
IXI Ltd. announced that it has further licensed its X.desktop Unix front-end user environment to IBM as part of the OSF/Motif package for Personal System/2 systems. This follows a February announcement that IBM has also licensed X.desktop for all RISC System/6000 Powerstations and Powerservers.

IBM is offering AIXwindows, the OSF/Motif graphical user environment on the PS/2 running the latest version of AIX, Version 1.2, which was also announced this week. AIXwindows Desktop is a tailored version of Cambridge, UK-based IXI's X.desktop 2. As a result of the incorporation of X.desktop, AIXwindows offers users an intuitive way of exploiting the PS/2 line.

■

Adobe Systems, Inc. announced Adobe Photoshop, a software package that allows Apple Macintosh users to produce both color and black-and-white images.

Adobe said Photoshop offers a complete palette of tools to edit and enhance images. Users can create original images and manipulate existing ones. The program works with images ranging from gray scale to indexed and true 24-bit color. Photoshop is "the first program to provide an integrated environment for creating and producing color images," said Aert Korteweg, marketing manager for application products at Adobe European headquarters in Amsterdam.



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PS/2

FROM PAGE 1

International Data Corp. (IDC) in Framingham, Mass. For example, the new Model 80 386 A31 equipped with the maximum four SCSI boards can accommodate 28 devices, including hard disk drives that conform to the SCSI industry standard.

Users said they also see the benefits of an SCSI server. The ability to attach multiple devices to the server will be particularly important in large, departmentwide LANs, said Mike Horowitz, senior systems consultant at Allstate Insurance Co.'s corporate information resource planning department.

Micro Channel Architecture (MCA) enables users to take advantage of intelligent I/O devices such as SCSI, because users can perform data transfer directly to the system memory without taxing the CPU with MCA, according to an IBM spokesman.

IBM's decision to pack its new Model 80s with SCSI interfaces and more system memory "definitely makes it more attractive to us," said Horowitz, whose firm owns more than 1,000 PS/2s.

IBM's chief personal computer rival, Compaq Computer Corp., does not offer SCSI in its Deskpro servers.

"SCSI gives you the capability to daisy-chain drives, but if you did that, it would degrade their performance," said Lorie Strong, Compaq's director of product marketing.

Although IBM did boost its lineup, Compaq is still superior, Strong contended. "Compaq introduced a 33-MHz 386 PC last May; IBM still hasn't got one," she said.

Compaq, considered a server market leader, sells a larger percentage of its PCs as servers than does IBM, according to IDC.

Still, IBM's server line needed this pick-me-up, analysts said. Despite an overall excellent year for the PS/2 family in 1989, "the one area where they lacked a competitive offering was the server area," Stephen said. The Model 80 server, introduced in 1987, was getting a bit long in the tooth, he noted.

In fact, the Model 80 accounted for less than 7% of 1989 PS/2 unit sales through U.S. computer retail outlets, according to Storeboard, Inc. in Dallas.

Perhaps more significant, Model 80 sales in January 1990 were down more than 22% from January 1989 levels. IBM said it will not discontinue the older model.

The only PS/2 that sold worse than the Model 80 last year was the Model 60. However,IBM's new Intel Corp. 80386SX-based Model 65 SX should be able to shore up this sagging middle of the line, observers said.

"It's definitely of interest to us to have a lower cost workstation available to run OS/2 in the future," Horowitz said.

However, Horowitz and others are not envisioning the 65 SX as the entry-level file server IBM is touting it as.

"I'm surprised IBM did an SX server," Stephen said. "The SX is a hot-selling processor for desktop systems, but I don't think it's a hot seller as a server" because it is less powerful.

IBM also announced price cuts last week of 15% to 24% on Model 30s, 60s and existing 80s. The price cuts were not a surprise, said Jay Stevens, an analyst at Dean Witter Reynolds in New York.

"Every time we go through one of these announcements, the price point moves down," he said.

PS/2 ramp-up

IBM rolled out six server-applicable PS/2s and a portable computer

	Processor	Standard memory	Standard storage	Price
Model 80 386 A31/A21	25-MHz 80386	4M bytes	320M bytes/ 120M bytes SCSI	$13,195/ $10,695
321/121	20-MHz 80386	2M bytes	320M bytes/ 120M bytes SCSI	$9,895/ $7,495
Model 65 SX 121/061	16-MHz 80386SX	2M bytes	120M bytes/ 60M bytes SCSI	$5,995/ $5,295
Model 70 386 031 (Portable)	16-MHz 80386	2M bytes	30M bytes	$5,995

Source: IBM — CW Chart: John York

Peripheral vision

Besides the Personal System/2 boxes, IBM last week also began shipping another portable PS/2 Model 70 and several peripheral devices.

- The new P70 is a less powerful version of the existing portable, but at 20 pounds, it is no less weighty. The machine features a 30M-byte hard disk drive and 2M bytes of system memory. Based on Intel Corp.'s 80386 chip, the portable sells for $5,995.
- IBM's first compact disc/read-only memory (CD-ROM) drive stores 600M bytes of ROM, the equivalent of 400 3½-in. floppy disks. The internal version (for Models 60, 65 SX and 80) costs $1,250. The external version for the rest of the PS/2 family costs $1,550.
- As part of its small computer systems interface (SCSI) charge, the firm announced SCSI hard disk drives in capacities of 60M, 120M and 320M bytes. Prices are $1,200, $1,920 and $5,500, respectively.
- Also on the SCSI front come two Micro Channel SCSI adapters. The cacheless model costs $495; a version with 512K-bytes of cache costs $995.
- An entry-level version of its existing 10 page/min laser printer, the new Laserprinter E, operates at 5 page/min but is upgradable to 10 page/min. The printer, which features Adobe Systems, Inc. Postscript options, is priced at $1,495.
- IBM's newest PS/2 color display, the 8515, features a 14-in. screen with 1,024- by 768-pixel resolution. It sells for $950.

IBM keeps promise with OS/2 Extended update

BY CHARLES VON SIMSON
CW STAFF

WHITE PLAINS, N.Y. — Rounding out the promised features of OS/2 three years after the operating system's introduction, IBM announced last week that Version 1.2 of OS/2 Extended Edition and LAN Server would ship by the end of this month.

Users and analysts said the latest version plays directly to the operating system's early adapters, while allowing for better accommodation of DOS.

"OS/2's pocket of strength has been in advanced networking," said Marshall Mosely, an OS/2 analyst at Dataquest, Inc. "It has been weak on the desktop, where its strength was expected. Extended Edition Version 1.2 will help on both counts."

Users seem to agree. OS/2 has found its strongest demand in advanced network environments, partially on the strength of earlier versions of Extended Edition, IBM's value-added addition to the operating system. It is the basis for Kentucky Fried Chicken Corp.'s leading-edge point-of-sale systems and also provides a basis for certain pieces of American Airlines' Sabre reservation system.

Extended Edition Version 1.2, which has been delayed by four months because of bugs and compatibility problems, is seen as an important extension of the capabilities that moved companies to OS/2.

"The early bugs in the system forced us to wait for a number of features, but the enhanced network functions seem to be fixed," said a systems developer at Fireman's Fund Insurance Co. in San Rafael, Calif., a Version 1.2 beta-test site. "After a real false start, IBM has delivered most of what got us into OS/2."

In addition, Version 1.2 allows for greater coexistence with DOS. Systems managers in DOS environments said that the newest functions of Extended Edition make OS/2 a more comfortable alternative.

Extended Edition 1.2 fills in several missing pieces of the system with three modules. The Communications Manager includes new connections to IBM minicomputers and a 3270 gateway, as well as support for additional protocols including X.25, Systems Network Architecture (SNA) LU0 and SNA LAN Gateway. The Communications Manager also offers support for more than 1,000 simultaneous LAN users.

The Database Manager, which includes a complete Presentation Manager interface, has new remote data services features that will enable DOS and OS/2 workstations to access the same remote databases. The Database Manager also has improved query functions enabling users to download mainframe data and format it in tables along with data from local applications in a single step.

LAN Requester is a component of Extended Edition that enables the sharing of resources between OS/2 workstations. The $1,040 price of Version 1.2 includes the DOS version of LAN Requester and entitles licensees to include up to 128 DOS clients. DOS LAN Requester was previously priced separately; its inclusion in Version 1.2 can save users as much as $30,000 in license fees on a 100-node installation.

Adapso urges dropping Singapore subsidy suit

BY DAVID A. LUDLUM
CW STAFF

Adapso, the leading trade association for U.S. software makers, has urged the U.S. Department of Commerce to drop an investigation into charges that the government of Singapore unfairly subsidized a software product.

Members of Adapso are worried that a decision to slap import duties on software from Singapore could lead to a trade war that would hurt U.S. software makers, said Douglas C. Jerger, a spokesman for the association.

Adapso officials also believe that the alleged subsidies have not harmed U.S. software companies, including the one that charged Singapore with unfair trade, Visible Systems Corp. of Waltham, Mass. That company has not contended that it has been harmed by the alleged subsidies.

Last August, Visible Systems charged that Singapore subsidized Pose, a computer-aided software engineering tool marketed in the U.S. by CSA, Inc. of Woodcliff Lake, N.J.

The Commerce Department was scheduled to make a final ruling in the case today. In January, it reached a preliminary decision finding that Singapore unfairly subsidized Pose and calling for countervailing duties on imports of the product.

Adapso asked the Commerce Department to use "moderation" in imposing import duties. It suggested the department base duties on clear evidence of subsidies.

One concern of U.S. software makers is that foreign governments could rule that the U.S. government provides subsidies through its arrangements for procuring software, Jerger said.

The preliminary ruling in the case was the first in which the Commerce Department found a software product had been subsidized. The ruling also broke new legal ground by establishing that software on disk or tape can be subject to U.S. import duties.

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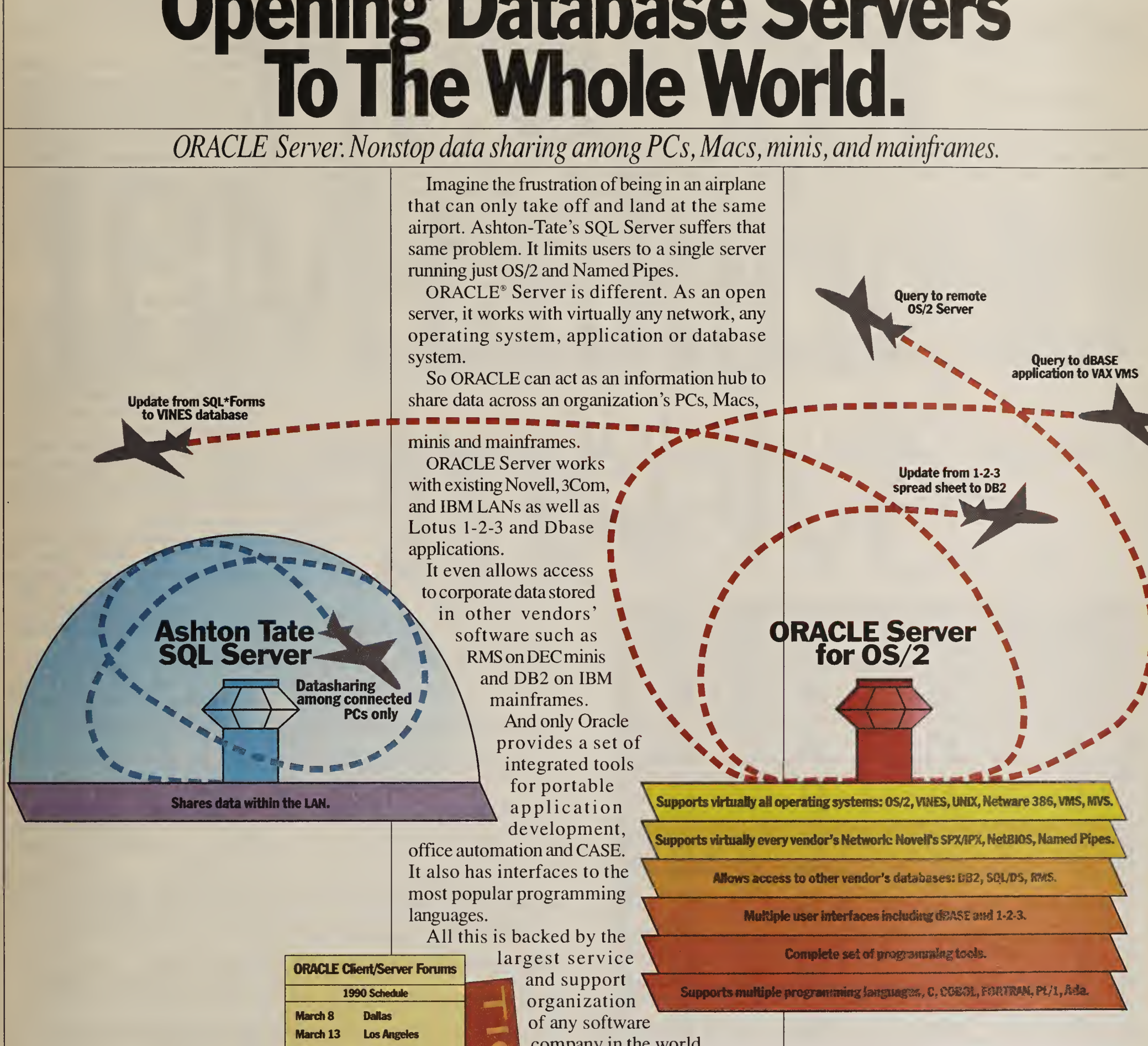

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IBM influence spreads to East German IS boundaries

IDG NEWS SERVICE

STUTTGART, West Germany — IBM Deutschland GmbH is quietly extending its influence to large computing centers in East Germany.

IBM's West German subsidiary, based in Stuttgart, recently began cooperative efforts with seven computing centers belonging to the Data Processing cooperative. With some 13,000 employees, the cooperative is the second largest supplier of information systems services in East Germany.

According to IBM Deutschland, it will work with GDR Data Processing Centers (DPC) and the continuing education academy of the Data Processing cooperative in training and continuing education, software development and the sale of selected IBM products as well as maintenance and consulting in East Germany. The products involved will be mainly IBM Personal System/2s, 9370s and Application System/400s.

According to Johann Weihen, head of IBM's commercial relations with East Germany, business activities can be started immediately. Activities will be based on the same dealer concept that IBM Deutschland currently follows in West Germany.

Boot camp

The DPCs, which were previously classified as legally independent enterprises, are now undergoing training programs in maintenance, sales and marketing to become IBM dealers.

Weihen also said the Data Processing cooperative was chosen because, among other attributes, its "computing centers provide employees [who are] highly qualified in software development and customer service. The strongest dealers are the ones who not only move the most units but who can also offer the entire service package as well."

In addition to providing computing time, the DPC also has substantial experience with software production. "It is usually the case that these houses conceive, design, program, test and install their applications for the customer," Weihen explained.

He said he expects that other qualifying East German businesses will be awarded IBM dealer status. "Concentration on the DPCs alone is not enough," he said.

Clear advantage

On the average, the DPCs employ between 600 and 800 people, Weihen said. Taking into account a couple of exceptions that already have IBM 4341 computers, all of the computing centers use Unified Electronic Computing System Technology computers.

These IBM 370-compatible computers, which are present throughout the Eastern Bloc, will provide market opportunities for IBM and offer an advantage over the competition.

Alfred E. Esslinger, president of IBM Deutschland GmbH, said he sees the agreement from another perspective: "For both sides involved, this is an important step toward the introduction of information technology support for businesses in East Germany."

In conjunction with the recent technology fair in Leipzig, Hans-Olaf Henkel, chairman of the board at IBM Deutschland, called for the "tearing down of the Cocom wall" or the immediate removal of East Germany from the Coordinating Committee on Multilateral Export Controls' (Cocom) sphere.

Henkel said he regards as outdated the Cocom treaties that make exporting strategic high-tech materials to the Eastern Bloc more difficult.

This report was prepared by the staff of Computerwoche, *an IDG Communications West German publication.*

IBM, Robotron sign agreement

PARIS — IBM Deutschland GmbH, the West German subsidiary of IBM, recently signed a cooperative agreement with East German electronics group VEB Robotron to service and maintain Robotron's medium-size computers in Eastern Europe.

According to IBM, the company will cooperate with the Robotron unit that manufactures auditing machines in Karl-Marx Stadt and Robotron's sales unit in East Berlin.

Further talks between IBM and Robotron will focus on the possibility of a joint venture. Such a venture would involve Robotron's activities in information systems.

IBM said that the partners will cooperate in the sales and service of IBM computer products in East Germany and in software development. It added that Robotron's medium-size computers were based on IBM computer architecture. This is the first agreement between IBM and Robotron.

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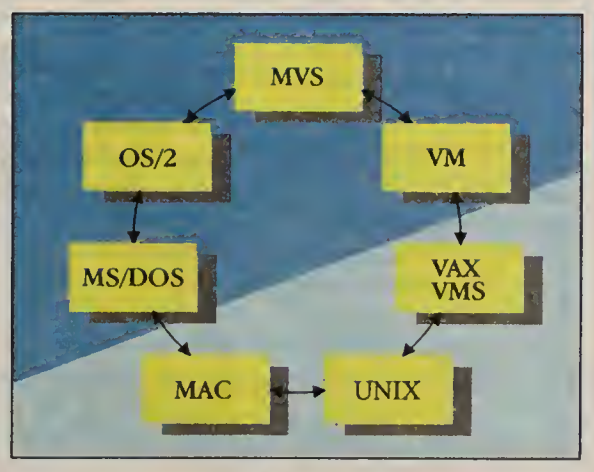

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Lotus upgrades Magellan, tunes up Symphony

BY SALLY CUSACK
CW STAFF

CAMBRIDGE, Mass. — Harried personal computer users may have something to cheer about as Lotus Development Corp. last week unveiled Version 2.0 of Lotus Magellan, its utility software for IBM and Compaq Computer Corp. PCs and compatibles.

Originally released last April, the program was designed to assist DOS-based PC users in finding, viewing and utilizing data stored on hard disks. The latest version reportedly includes additional tools that allow users to quickly locate data, compress files, recover deleted files and check for possible file corruption because of viruses.

The package is user-customizable and costs $139. Current Magellan users can obtain an upgrade for $39.

In a separate announcement last week, Lotus began shipments of Symphony 2.2, the latest version of its multifunction, integrated PC software package.

"I don't see the latest release [of Symphony] dramatically increasing market share for high-end integrated packages," said Bill Higgs, vice-president at Santa Clara, Calif.-based Infocorp/Gartner Group, a market research firm.

Version 2.2 includes file linking between Symphony and Lotus 1-2-3 Release 2.01 and 2.2 files and incorporates the Lotus Magellan viewer utility program. The package also offers Personics Corp.'s @Base program and a more functional integration of Allways publishing technology, according to Lotus.

With a suggested list price of $150, some Symphony users may think twice before purchasing the upgrade. Beta tester Hilly Fuchs, director of information systems development at Continental Grain Co. in New York, said his company will only upgrade part of its installed user base. Continental Grain has approximately 3,000 PC users, about 1,200 of whom run Symphony.

Symphony 2.2 requires a hard disk, one floppy disk drive and 512K bytes of memory; there is a 640K-byte memory requirement for Allways or @Base add-in programs.

HDS boosts mainframes

BY J. A. SAVAGE
CW STAFF

Focusing its new marketing organization on IBM 4381 and low-end 3090 mainframe users, Hitachi Data Systems introduced two new models of its own mainframes last week.

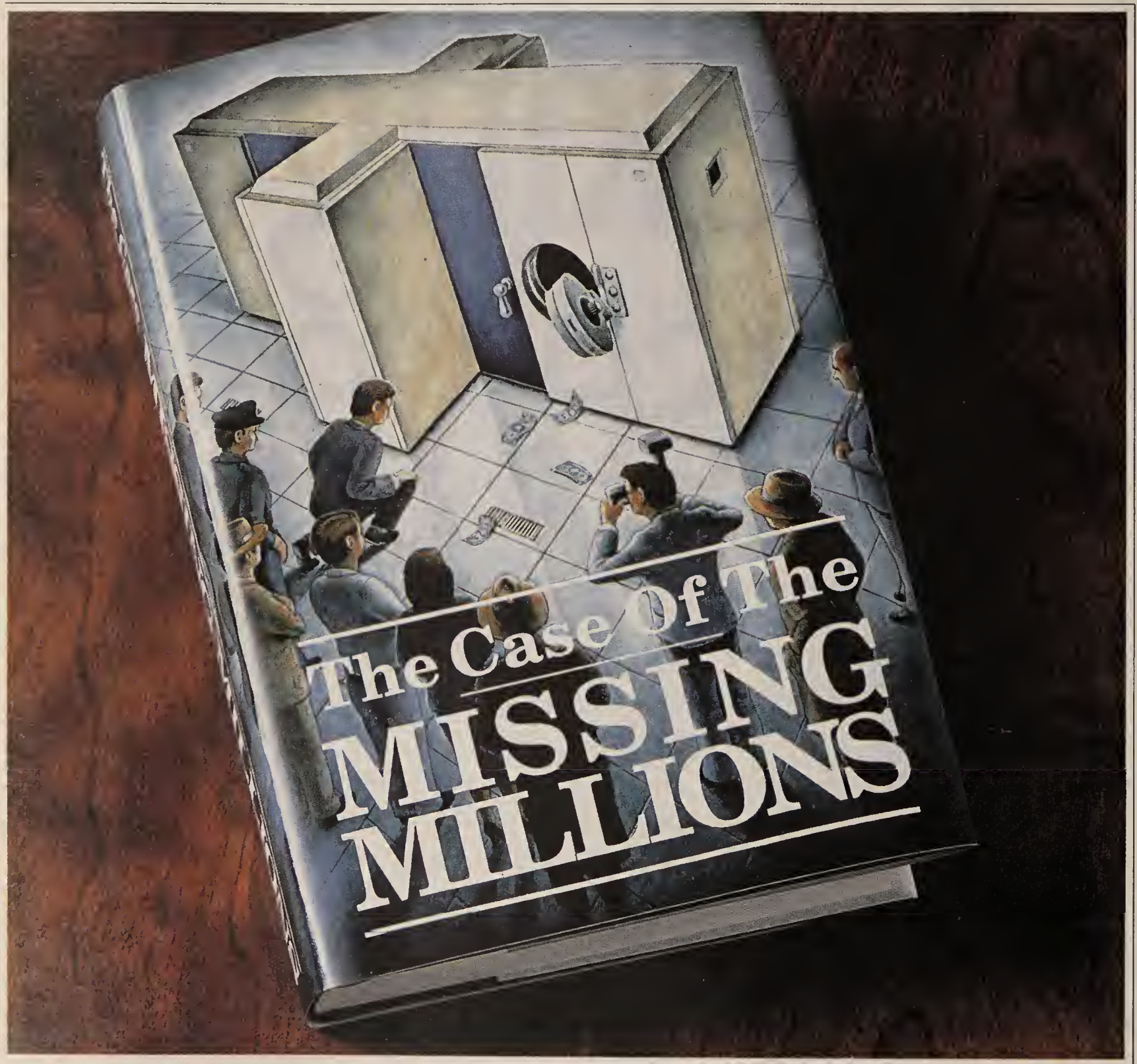
HDS' Paul Hastings, vice-president of product marketing for intermediate systems, said his company is trying to provide a growth path for 4381 users while they wait on a 4391 announcement from IBM. Currently, if a 4381 user wants to stay in IBM's fold, the option is a 3090 mainframe, which requires water cooling and more floor space.

HDS has put new resources into marketing since it was bought by Hitachi Ltd. and Electronic Data Systems Corp. one year ago; this is the first public view of that change.

While the company may be repositioning, the models have changed little, according to Bob Djurdjevic, president of Annex Research, a Phoenix-based consulting firm.

Sandwiched between its AS/EX Models 30 and 35 is the Model 33 uniprocessor with a list price of $1.38 million. According to the company, it almost equals the performance of an IBM 3090-150J, or up to 10 million instructions per second.

A dual-processor computer, the AS/EX 44, now tops the previous AS/EX 44 model by about 25 MIPS, HDS said. It is priced at $2.63 million.



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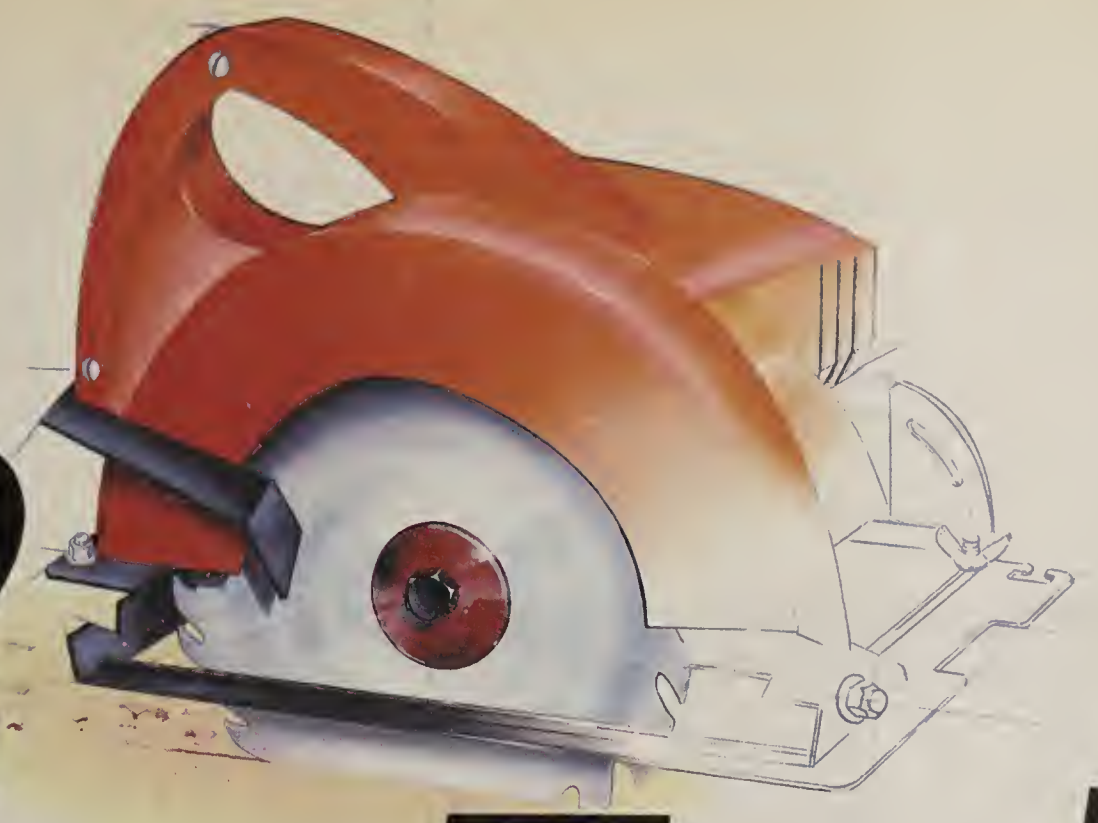

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Business Partner

BMC SOFTWARE

Legal eagles train eyes on $48M verdict

BY CHARLES VON SIMSON
and JIM NASH
CW STAFF

LOS ANGELES — When the jury hands down the final verdict on damages in a $48 million computer liability case in U.S. District Court next month, its decision is likely to change the legal aspects of the relationship between computer systems vendors and their customers.

On April 17, the trial will begin to award final damages in the case of plaintiff Geophysical Systems Corp. (GSC), an oil and gas exploration company in Pasadena, Calif., vs. Seismograph Service Corp. (SSC), a Tulsa, Okla., software and service subsidiary of Raytheon Co. If the full $48 million award from the case's initial trial stands, it will represent by far the largest computer liability decision to date.

Such an award could push users and vendors to take contract language more seriously. According to lawyers who have worked on computer liability cases, contracts are often seen as formalities and are too casually worded. Typically, too little emphasis is placed on narrowly defining the expectations of both vendors and suppliers, they said, which will have to change as technology becomes more critical to business and as damage awards increase.

"The size of the award demonstrates the critical nature of technology in business," said Lee Hagelshaw, a partner in the San Francisco law firm of Hagelshaw and Cole and editor of the "Computer Liability Report" newsletter. "It will mean that the signature on a systems contract will have to mean something; it will not just be a formality to get the project rolling."

At the conclusion of the first trial in December 1988, a jury awarded GSC $48.3 million plus costs for damages incurred when seismic data processing software from SSC failed to work as promised on GSC's Digital Equipment Corp. VAX computers. GSC claimed that none of several software runtime performance requirements were met and that data interpretation applications did not work as promised.

GSC claimed that SSC's inability to process the data to be used in the seismic mapping of underground oil deposits destroyed its business, a contention that the jury supported. The bulk of the damage award is based on GSC's claim that the failure of the system and subsequent lost contracts forced it to file for Chapter 11 bankruptcy protection in 1983.

While upholding the breach-of-contract verdict, Judge A. Wallace Tashima set aside the damage award because he said he felt the jury did not fully understand the implications of his decision to throw out the plaintiff's fraud claim. This set the stage for next month's retrial.

Back on its feet

GSC, still operating under Chapter 11, is hoping the award will help it get back on its feet. "When you commit to a computer company, that is a major commitment," said William Walter, GSC's chief engineer. "When their systems started to fail, we had built the business around them. We were in big trouble."

The defense has argued that systems did not fail and that, in the cases in which the jury found they did fail, they did not substantially contribute to the failure of GSC's business.

"To the extent that we have been found to have breached [the contract], those breaches did not cause them any significant damage," said Steve Holtman, a partner in the Cedar Rapids, Iowa, law firm of Simmons, Perrine, Albright and Ellwood, the attorneys for the defendant. "It certainly did not contribute to the downfall of the company."

While several multimillion-dollar liability awards have been made in the past for systems that failed to function as promised, none comes close to the size of the GSC verdict. The few that are not settled out of court typically result in awards in the $3 million to $5 million range.

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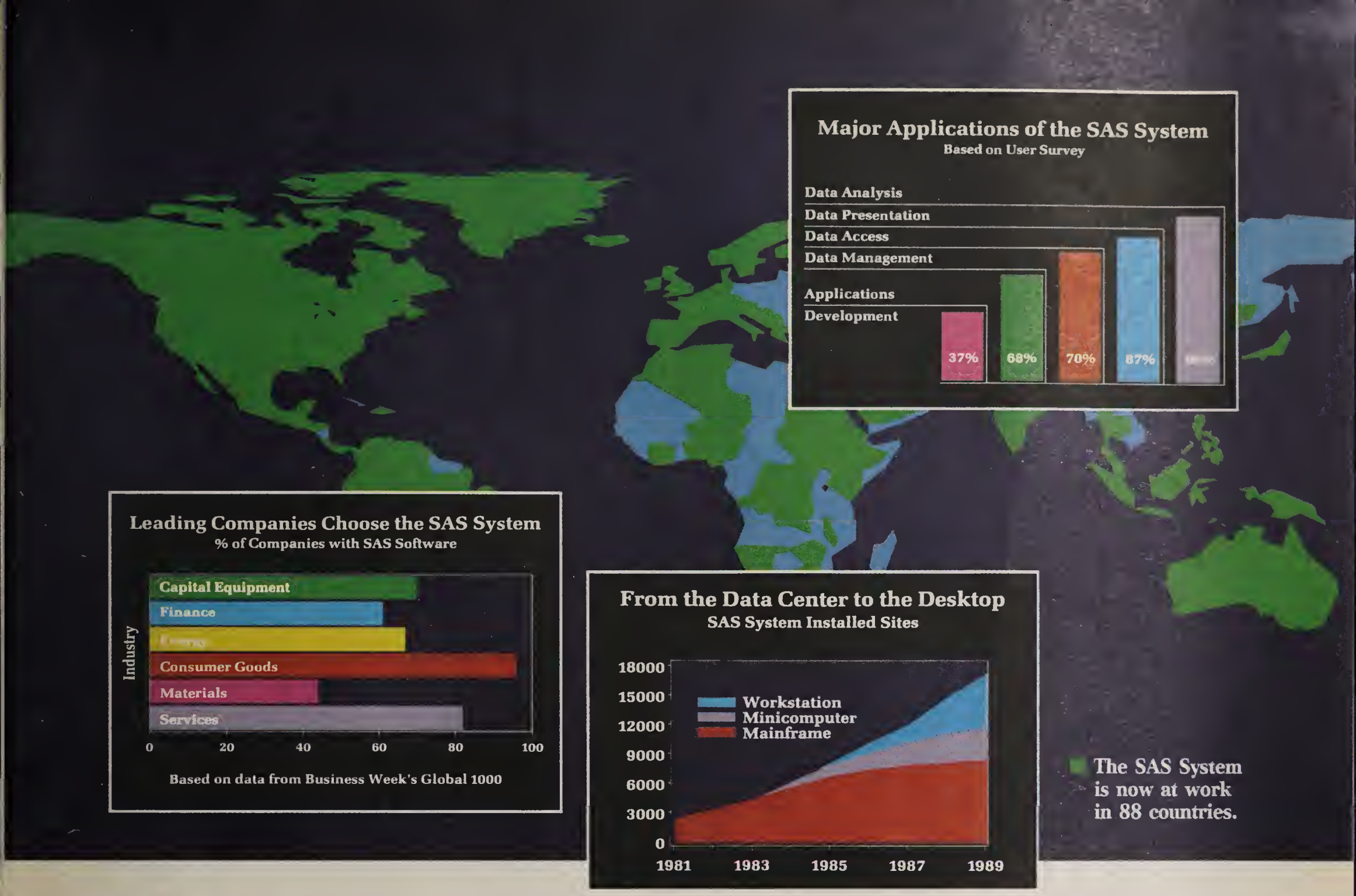

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Floating Point Systems seen cutting back on sales force

BY J. A. SAVAGE
CW STAFF

BEAVERTON, Ore. — Posting still another losing quarter, Floating Point Systems, Inc. (FPS) appears to be cutting back on its sales force in order to trim expenses.

Since the beginning of the year, FPS has fired between five and 10 salespeople, mostly on the East Coast. Former employees who wished to remain anonymous said this leaves as few as 15 U.S. sales representatives for the company.

Stephen Campbell, vice-president of marketing, maintained that 50 salespeople remain, although he conceded that offices have been "consolidated."

Theresa Liu, an analyst at Montgomery Securities in San Francisco, said she would not be surprised by the lower number. "I've heard they are prepared to be a service company. It looks dismal," Liu said.

The company cut about 250 jobs in 1989. At its annual meeting, held earlier this month, Chief Executive Officer Howard Thrailkill said the company was down by a total of another 20 employees, leaving more than 400, according to Campbell.

FPS has reported losses for the last three years, totaling about $74.4 million, on steadily decreasing revenue. The company, a pioneer in minisupercomputers, recently began concentrating on production of a stand-alone Unix-based computer, the Model 500, rather than its original line of front-end systems for Digital Equipment Corp. VAXs.

In 1988, it abandoned research and development efforts on a massively parallel supercomputer and was unable to find any companies willing to buy out its technology.

According to ex-employees, FPS has sold about 40 Model 500s, but all sales have been at deep discounts, primarily to universities and nonproduction sites. Campbell would only say that there "were more than 35" installations and said the average system price has been about $500,000.

The system's list price ranges from $395,000 to $1.75 million.

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So if your applications backlog has created an enormous bottleneck in your productivity, ART-IM can help you find your way out. For complete information, call Chris Dow at (213) 417-7997.
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Software group charges major firms with piracy

BY RANDAL JACKSON
SPECIAL TO CW

AUCKLAND, New Zealand — A major New Zealand bank, an oil company and an entertainment group are among the companies identified by the Business Software Association (BSA) as allegedly pirating software here.

When it has finalized its case, the association said it will attempt to prosecute one of the most prominent offenders under the copyright laws.

Association spokesman Don Sykes of Imagineering Software estimated that his company alone would double its revenue if pirating and gray market sales were eliminated. Imagineering has the Lotus Development Corp. distribution license for New Zealand, and Sykes said requests for service and product updates indicate it has probably supplied only 20% of all Lotus software that is now used in the country.

Sykes would not publicly identify the alleged offenders. "But we'll definitely be prosecuting one of them," he said.

Another BSA committee member, Peter Macaulay of Number One Software Co., said many companies have begun straightening out their affairs, and some have requested audits. He said senior management was often unaware of pirating because it usually happened at the middle-management level to cut expenses.

Learning-based

In the longer term, education is the main area the association will target to try to reduce the problem.

The U.S.-based BSA was formed in 1988 as a collective of key software companies concentrating on software protection, piracy and market-access issues.

The visiting chairman of the association, David Curtis, who is a Microsoft Corp. senior attorney, and Lotus international counsel Neal Goldman met local industry representatives from Microsoft, Ashton-Tate Corp., Imagineering, Number One Software and Itanz last September to talk through the problems. A local branch of the BSA was later established by the firms.

At that time, Curtis said the group's focus would be end-user piracy, mainly in the commercial and education markets, to ensure that users understood the copyright laws and could reevaluate their software acquisition policies.

Jackson is a reporter at Computerworld New Zealand.

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ADVANCED TECHNOLOGY

For the disabled, home is where the future is

State-owned showcase of customized devices for the handicapped promises hope of an independent tomorrow

BY MARYFRAN JOHNSON
CW STAFF

A 19th-century Baltimore toll house that once played host to the horse-and-buggy set is becoming a high-tech living laboratory of home automation for people with disabilities.

Although the outside of Smith's Tavern on Jarrettsville Pike has been restored to its classic 1855 appearance, the now-gutted interior of the historical landmark will reflect the next century rather than the past.

When it finally opens to the public next year, the Toll House Future Home will be a fully automated, computer-driven "intelligent" house loaded with motion detectors, infrared sensors, video cameras and speakers.

"The house will be able to touch, feel and see what's going on around it," said Wilson Rivera, a Westinghouse Co. engineer who manages the project for the Volunteers for Medical Engineering (VME), a nonprofit Baltimore-based organization that adapts technology to assist disabled people.

The state-owned building will be a showcase of products, systems and customized devices that will enable the handicapped to live independently. A personal computer will control all systems in the house through customized software programs.

Curators in residence

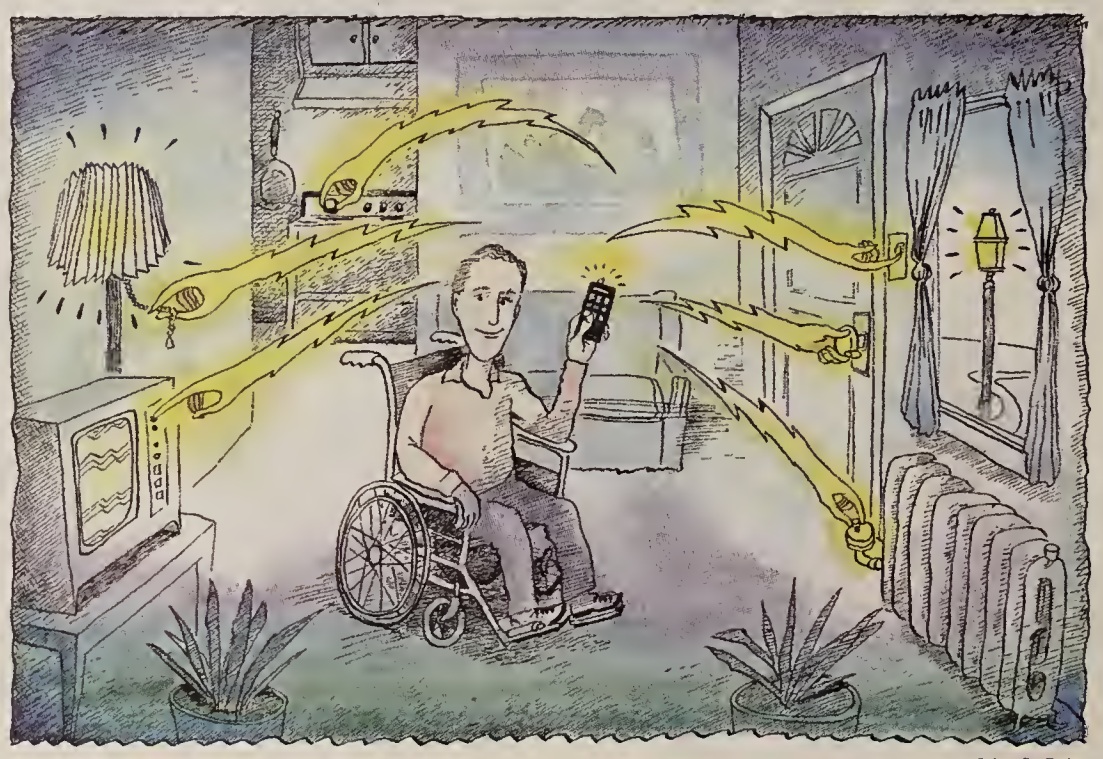
Future Home will also be the home of David and Terri Ward, the state-appointed resident curators who have spent $100,000 of their own funds to renovate the exterior. The interior gadgetry will be supplied by VME members, using low-cost, off-the-shelf electronics married to computer software.

"One of the real problems in selling home automation, and even computers, is there are still numerous people in this country who are intimidated by technology," said David Ward, who is wheelchair-bound after being paralyzed from the neck down in a fall 13 years ago.

In addition to living in what he cheerfully calls "a testbed of technology," Ward will act as master of ceremonies for tours of handicapped people. "We want to set up the environment for them so they get more control over it without having to do anything," he added. "They don't even have to know they're using it."

For people who cannot push a button or flip a switch, a voice command may be used to activate security cameras, turn up the stereo volume or drop the room temperature by a few degrees. The click of an infrared remote controller — similar to the ones used to change TV channels — could turn on the oven, start the coffee maker or fire up the hot tub.

Even the blink of an eye could activate a preprogrammed series of events or "scripts." A "going to bed" script, for example, might turn down the heat, arm the external security cameras and dim the lights.



John S. Dykes

"A lot of technology that able-bodied people use can *almost* be applied as is for the disabled community," Rivera said. "But David can't use a touch screen because he can't raise his hands. So we have to solve a different human interface problem for him."

By taking existing technologies in "bits and pieces," the VME is designing a system flexible enough to switch-hit from one disability to another, Rivera explained: "We want to make it adaptable to the needs of various disabled communities. An audio system might need to become a system controlled by visual blinking or touch screen tomorrow."

Behind it all will be "computer brainpower" in the shape of an IBM Personal Computer or compatible clone or an Apple Computer, Inc. Macintosh, depending on which machine is donated to VME.

The house is now being wired with fiber-optic, coaxial and twisted-pair telephone cable to carry signal traffic to and from various appliances and devices. From a lab on the second floor, separated from the Wards' living quarters, the VME engineers will control the home management systems and experiment with newer gadgets as they hit the market.

"We're leaving ourselves open to infuse all sorts of technology later," said John Staehlin, a Westinghouse consulting engineer who founded VME in 1981. Baltimore VME members will share what they learn in running Future Home with 12 VME chapters nationwide.

The donated home management devices being used are Home Manager, a touch-screen environmental control device from Unity Systems in Redwood, Calif., and Butler-in-a-Box, a voice-recognition device from Mastervoice, Inc. Since Home Manager and Butler-in-a-Box were not intended to function in tandem, the engineers are joining the dedicated processors in the two home management devices with a PC software interface.

Also integral to the functioning of Future Home is a prototype audible recognition intelligent computer, a voice-recognition, voice-synthesis computer designed by another Westinghouse engineer, Herb Otto.

Standards struggle

One complication in creating this "intelligent" house is the ongoing industry battle over which electronics wiring technology will become the home automation standard.

In one corner is Smart House; in the other, the Consumer Electronics (CE) Bus. Both are universal communications protocols that allow consumer electronics, heating and cooling systems, PCs, appliances, security systems and telephones to communicate with one another.

With its first products due in April 1991, Smart House will initially work only for new construction because of the wiring, gas and plumbing systems required. The system has been under development for five years by the Maryland-based Smart House Limited Partnership, a private, wholly owned subsidiary of the National Association of Home Builders.

CE Bus is being developed by the Electronics Industry Association, a nonprofit trade group in Washington, D.C. Eventually, the group will set separate standards for manufacturers of home automation devices covering power line access, command language, coaxial and twisted-pair cable and a "single room" bus that controls infrared and radio signals.

Future Home is being wired only for CE Bus, Ward explained, because acquiring the Smart House technology would have cost the VME at least $15,000 to wire the house.

"What's holding us up now is, as much as anything, financial. All of our electronics, everything, are being donated by somebody," said Richard Goldman, technical director for Future Home and president of Intellitech, Inc. in Owings Mills, Md.

Eventually, the group hopes to support Future Home through the sale of the home management software or other devices created there.

Welcoming folks of all trades

The first mistake people make about the Volunteers for Medical Engineering (VME) is thinking that the nonprofit group is comprised only of engineers.

Actually, the organization welcomes the expertise of secretaries, artists, technicians, accountants, mathematicians, lawyers and anyone else whose skills might assist the disabled.

With chapters in 12 states, VME has helped about 500 handicapped or elderly individuals by adapting technology to their needs, said VME President John Staehlin, a Westinghouse Co. consulting engineer who founded the group in 1981.

Two of VME's inventions, available through the organization, are the VME Mobile Standing Frame and the VME Blink Writer.

The standing frame functions as a standing wheel chair for paraplegics, while the blink writer attaches to eye glass frames and allows the user to control computer cursor movement through eye blinks.

The VME can be reached through The Good Samaritan Hospital in Baltimore at 301-532-4360.

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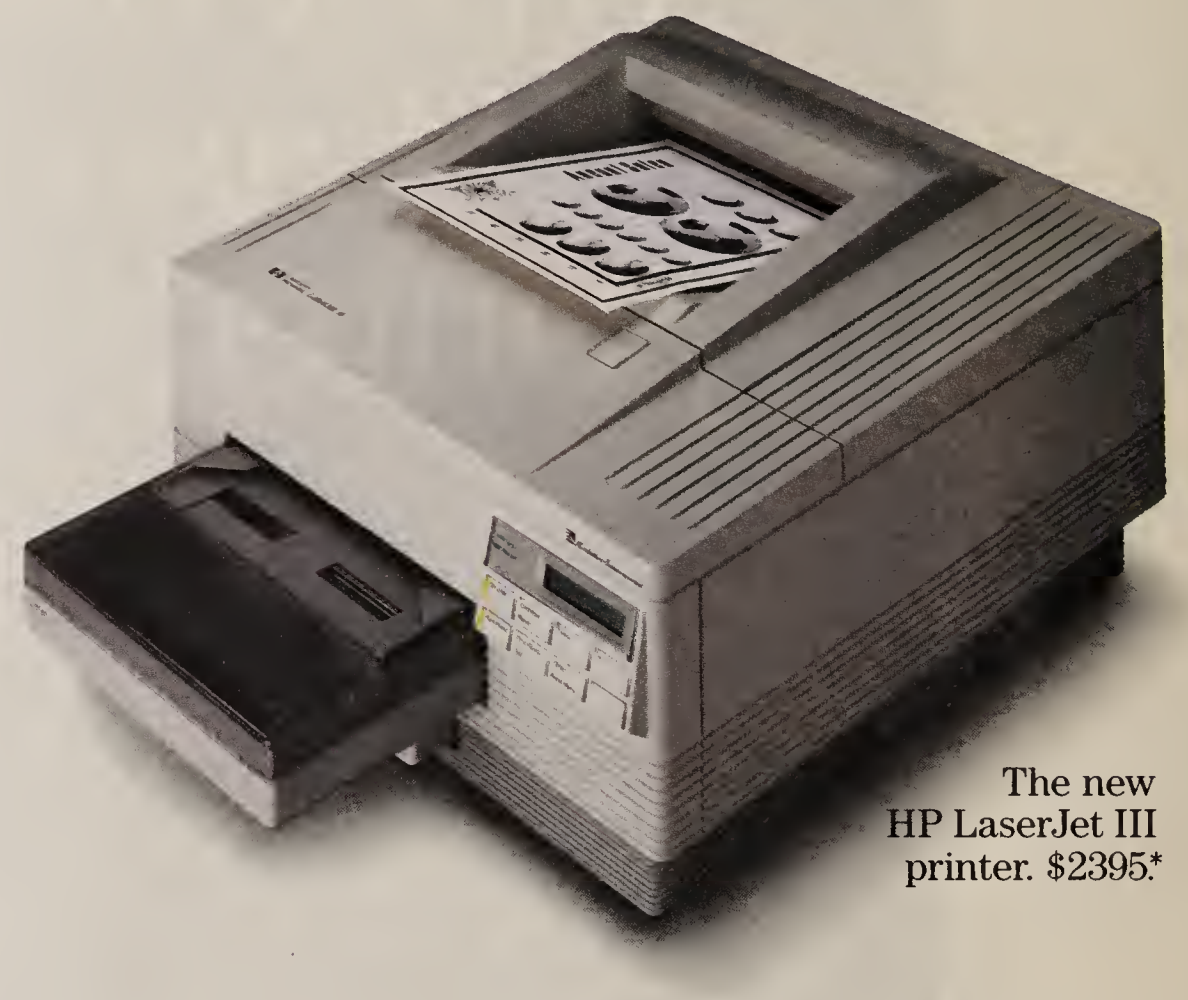

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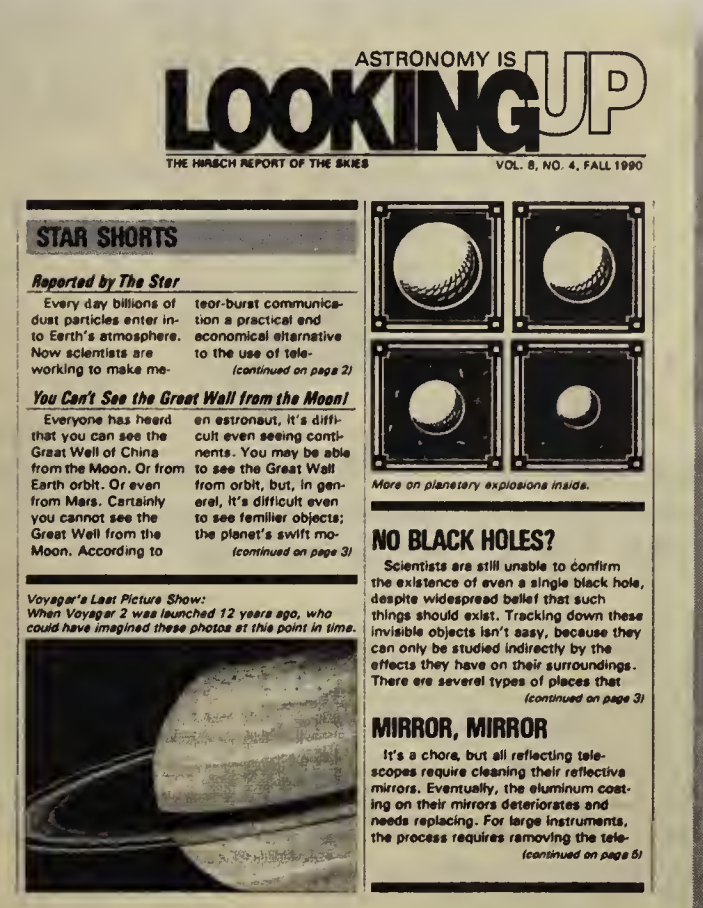


ASTRONOMY IS
LOOKING UP
THE HIRSCH REPORT OF THE SKIES
VOL. 8, NO. 4, FALL 1990

STAR SHORTS

Reported by The Star

Every day billions of dust particles enter into Earth's atmosphere. Now scientists are working to make me-

(continued on page 2)

teor-burst communication a practical and economical alternative to the use of tele-

You Can't See the Great Wall from the Moon!

Everyone has heard that you can see the Great Wall of China from the Moon. Or from Earth orbit. Or even from Mars. Certainly you cannot see the Great Wall from the Moon. According to

(continued on page 2)

en estronaut, it's difficult even seeing continents. You may be able to see the Great Wall from orbit, but, in general, it's difficult even to see familier objects; the planet's swift mo-

(continued on page 3)

More on planetary explosions inside.

NO BLACK HOLES?

Scientists are still unable to confirm the existence of even a single black hole, despite widespread belief that such things should exist. Tracking down these invisible objects isn't easy, because they can only be studied indirectly by the effects they have on their surroundings. There are several types of places that

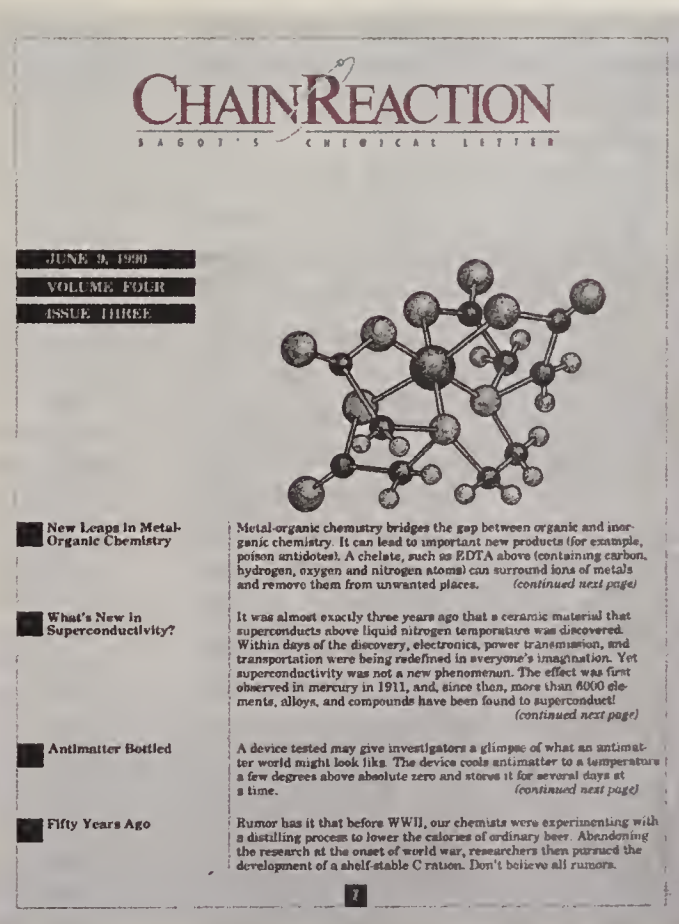
(continued on page 3)

MIRROR, MIRROR

It's a chore, but all reflecting telescopes require cleaning their reflective mirrors. Eventually, the aluminum coating on their mirrors deteriorates and needs replacing. For large instruments, the process requires removing the tele-

(continued on page 5)

Voyager's Last Picture Show:
When Voyager 2 was launched 12 years ago, who could have imagined these photos at this point in time.



CHAIN REACTION
DAGOT'S CHEMICAL LETTER

JUNE 9, 1990
VOLUME FOUR
ISSUE THREE

New Leaps in Metal-Organic Chemistry

Metal-organic chemistry bridges the gap between organic and inorganic chemistry. It can lead to important new products (for example, poison antidotes). A chelate, such as EDTA above (containing carbon, hydrogen, oxygen and nitrogen atoms) can surround ions of metals and remove them from unwanted places. *(continued next page)*

What's New in Superconductivity?

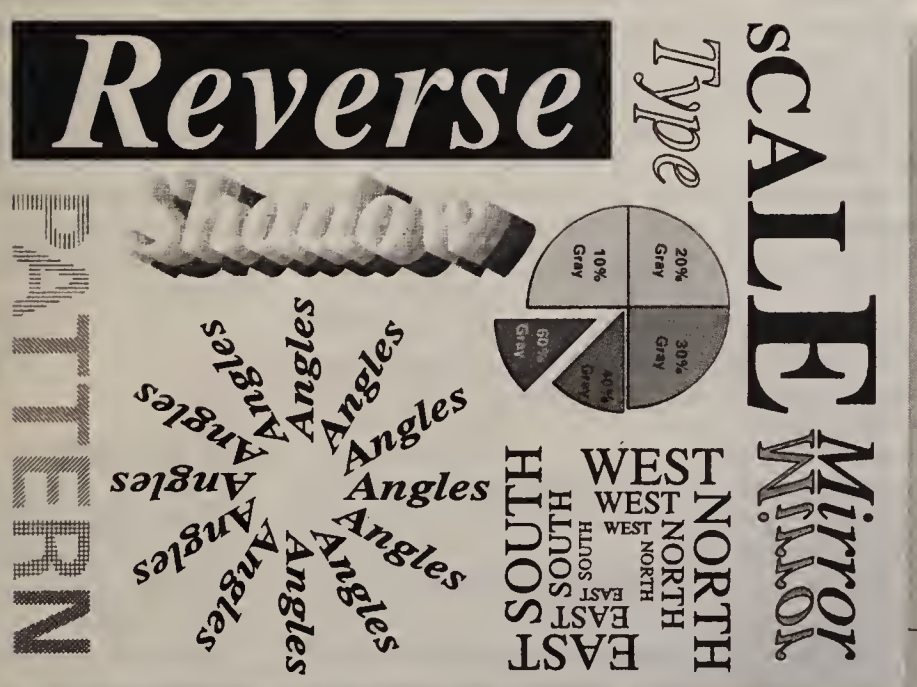
It was almost exactly three years ago that a ceramic material that superconducts above liquid nitrogen temperature was discovered. Within days of the discovery, electronics, power transmission, and transportation were being redefined in everyone's imagination. Yet superconductivity was not a new phenomenon. The effect was first observed in mercury in 1911, and, since then, more than 4000 elements, alloys, and compounds have been found to superconduct!
(continued next page)

Antimatter Bottled

A device tested may give investigators a glimpse of what an antimatter world might look like. The device cools antimatter to a temperature a few degrees above absolute zero and stores it for several days at a time. *(continued next page)*

Fifty Years Ago

Rumor has it that before WWII, our chemists were experimenting with a distilling process to lower the calories of ordinary beer. Abandoning the research at the onset of world war, researchers then pursued the development of a shelf-stable C ration. Don't believe all rumors.



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EDITORIAL

On the fence

IT'S A STORY we've heard again and again: An alluring technology stalls because the user base stops short of critical mass. Electronic data interchange's two-year surge may be slowing because technical and cost issues can't be resolved quickly enough.

In theory, EDI's electronic umbilical cord between buyers and sellers offers tantalizing opportunities for productivity gains. Imagine if a department store's order for 5,000 blouses could be fed electronically into the manufacturer's flexible controllers on the ship floor, where stitching machines retool to make just the right mix of garments. Then the data is passed to the shipping department, which schedules it on the first available truck, and to accounts receivable, which bills the buyer electronically. Meanwhile, the computer is collecting data about the buyer's ordering habits.

The technology exists to do this right now, but EDI is running into some walls that are just going to take time to tear down. First, there's that old standards bugaboo: Different industries use different EDI formats, and an international standard is still a long way off. Users who have taken the EDI plunge say multiple standards aren't so bad after all, but EDI newcomers are put off by all the haggling and obscure acronyms. They're sitting on the fence.

Fence-sitting is a problem in itself. EDI, by its very nature, offers bigger benefits with more frequent use. Companies that go fully to EDI for all dealings with their suppliers can begin to rethink the whole supplier/customer relationship. Not only can they cut paperwork, but they can also use EDI input to trigger multiple events in the office and in the factory at the same time. Virtually nobody is 100% EDI-capable now, and the few companies bold enough to force the issue have taken heat from their suppliers. Small suppliers often don't want to pay the up-front investment in time, hardware and business restructuring that EDI requires, but forcing the issue is the only way to get them on the bandwagon.

Then there are the legal issues. EDI's limited use to this point has kept it from being the subject of a major lawsuit, but experts say it's only a matter of time. What will happen when a customer sues a supplier, claiming it never ordered those 5,000 blouses, and the supplier can't provide a paper trail to back itself up? Who is responsible for a message that is sent but never received? There's no way to tell how such cases would be resolved. In the meantime, stopgap contract language will do little to make potential users feel more comfortable.

It would be unfortunate to see these concerns hobble an otherwise promising movement. EDI has the potential to improve productivity sharply in some of the most paper-intensive and error-prone functions of business. By offering incentives to small suppliers to take the plunge, big buyers can help the process along. The EDI industry can also contribute by resolving to explain the concepts in terms that the small-business owner can understand.

LETTERS TO THE EDITOR

No magic

I do not agree that Robert T. Morris is a computer wizard, as you would have me believe [CW, Jan. 29]. A computer wizard, in my opinion, is someone who can identify and solve complex computational problems using conceptional, theoretical and practical techniques that most programmers would not possess.

Ideally, a computer wizard would have a rather high intellectual quotient, work well with other programmer/analysts, develop advanced and sophisticated computer systems and have sufficient self-esteem and integrity to be considered a role model for others.

However, it would appear that Morris is only an individual who has shown where a lack of sufficient controls can result in unauthorized access, destruction of sensitive or critical data and unnecessary loss of computing capabilities while the virus is located and eradicated. Morris should not be treated as someone with superior intelligence and cunning but rather as someone who was caught committing a criminal offense and who will spend time in jail as a result. If there ever was a computer wizard, in my opinion it would have to be the person who invented pull-down windows.

Jon L. Campbell
EDP Auditor
Honda North America, Inc.
Torrance, Calif.

Old news

I take exception with the cartoon about the non-IBM customer [CW, Feb. 5]. For those who have less than a Hewlett-Packard Co. HP 3000, I can understand their feelings. But for those of us who have had the privilege and joy of working on an HP 3000, this is a joke.

The HP 3000 series of computers has been doing for 15 years what IBM claims its AS/400 does now. We can compile in C, Fortran, RPG, Cobol, SPL and Pascal on the HP and can execute them without needing any special interpreter. We have relational and network and ISAM database structures. We can take a program compiled 10 years ago and run it on the latest machine without recompiling it.

In a nutshell, we have had (and then some) for 15 years what IBM has only recently come out with in its marketing of the AS/400. I feel sorry for those misled by your cartoonist's obvious ploy to aid IBM in perpetuating its illusions.

Colin J. Schmidt
Software Analyst
The Bovaird Supply Co.
Tulsa, Okla.

Shakedown street

As a published author, I naturally have a vested interest in supporting any reasonable steps to combat piracy or theft of intellectual property. However, I cannot condone the shakedown tactics being used by the Software Publishers Association and cited in "SPA claims it's winning" [CW, March 12] and "Open your door or we'll sue" [CW, Feb. 26].

What happened to the principle that everyone is presumed innocent until proven guilty? What happened to the principle that anyone who is accused has the right to face his or her accusers?

Both of these principles go out the window when SPA solicits anonymous accusations on a toll-free hot line. On the phone, it is easy for callers to lie about who they are and what they've seen. Even a completely innocent company would find it unpleasant and disruptive to be exposed to an SPA audit.

Records get misplaced. It may be easier to pay whatever money Mary Jane Saunders demands than to go to the effort of locating all of the records that would prove the company innocent.

Software piracy, or any other theft of intellectual property, is wrong; however, so is abusing the legal system to harass everyone you don't like. Let's remember that the end doesn't justify the means.

Alida M. Jatich
Cogito Corp.
Chicago

Not so fast

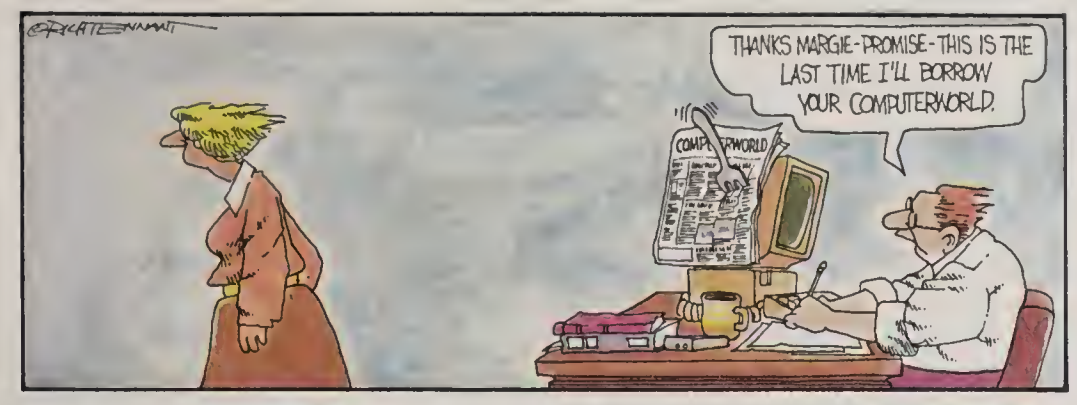
You said that "today's DASDs are roughly a million times faster than a 30 millisecond access time" [CW, March 5].

By rough calculation, that works out to an access time of 30 nanoseconds. I hope *Computerworld* will tell its readers where they can purchase such a fast drive.

It appears that some of CW's writers and editors were decimated by decimals.

Owen K. Darrath
Brockton, Mass.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax: (508) 875-8931; MCI Mail: COMPUTERWORLD.*



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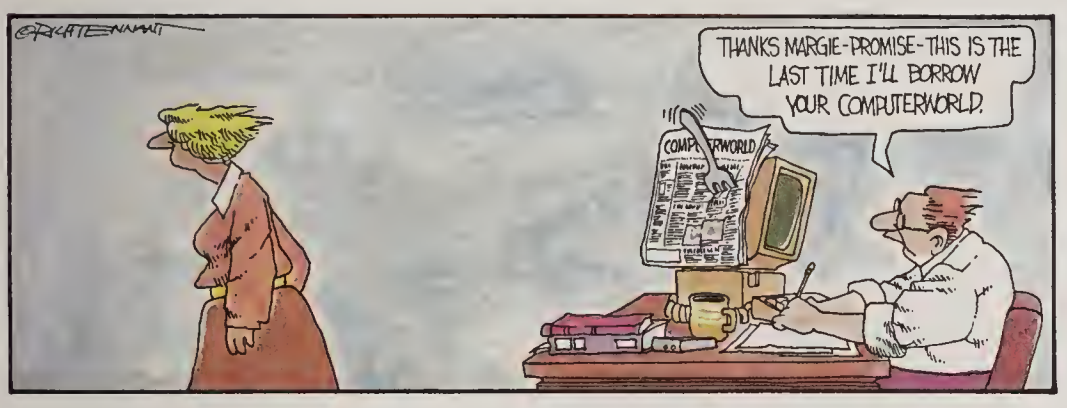

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Raising the information curtain

PETER MARX

More than 40 years ago, Winston Churchill declared that an "Iron Curtain" of Communist domination had rendered Eastern Europe separate from the "free world." Since then, Churchill's expression has come, in part, to symbolize the ways in which the Communist bloc has used information — its denial, control and fabrication — as an instrument of political power.

Now, the Iron Curtain is being raised from within. For the first time in decades, information is beginning to flow freely throughout Eastern Europe.

The effects of information deprivation, especially electronic information, have been crippling for Eastern Europe.

Though we take it for granted, information services now provides the foundation for our banking, travel and transportation systems and for many other industries. On-line information is fundamental of modern economies and progressive enterprise. Information services have become so ubiquitous that it is hard to imagine how capitalist societies could function without them. It is equally difficult to fathom how Eastern Europe can revise its economies without opening some of the same information services spigots that supply the West.

What is needed today is a new national directive designed to promote Eastern Bloc access to information services. Such a policy would benefit the U.S. as well as Eastern Europe.

A few years ago, the U.S. attempted to drape its own mantle of censorship over Eastern Europe. It was a kind of "On-line Curtain," a ban imposed by the National Security Agency on exports of all Western information services to the Eastern Bloc.

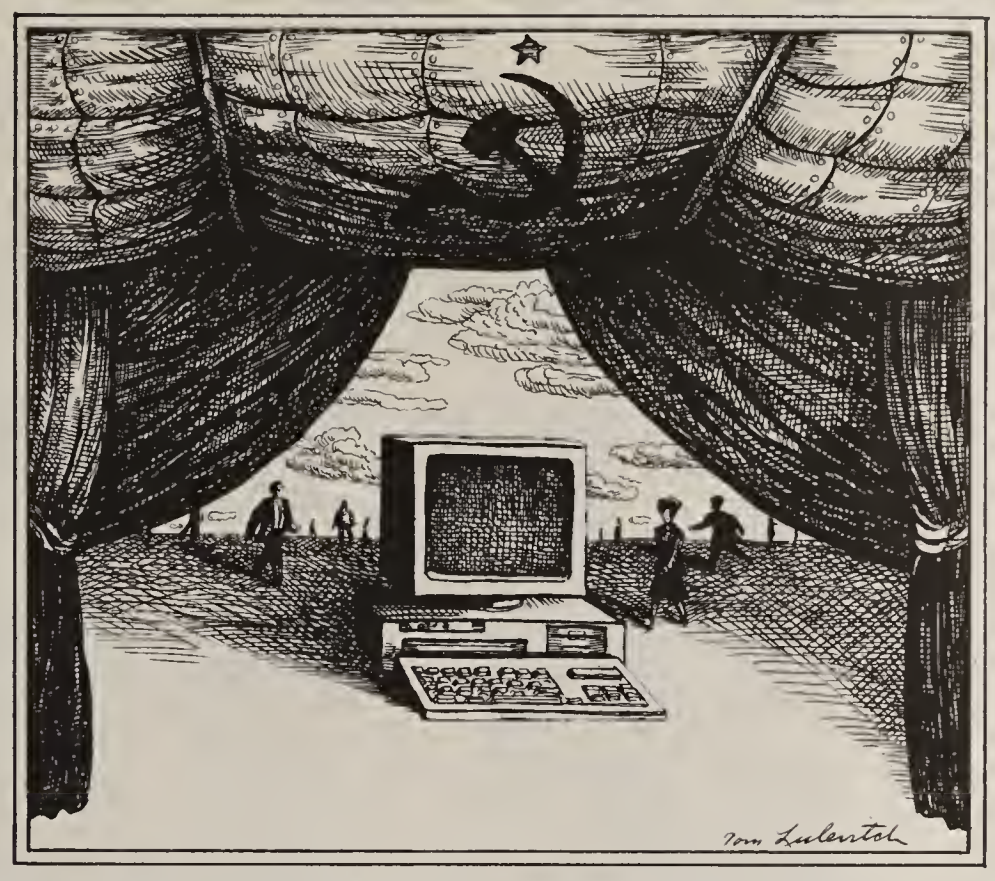
U.S. information services export curbs began in 1985 after the U.S. Defense Department argued that such access by the Soviet Union and its allies could compromise our national security. The result was former President Reagan's issuance of National Security Decision Directive (NSDD) 145, which created a category of "sensitive, but unclassified" information.

The directive was based on the so-called "Mosaic Theory," which posited that on-line information services users can manipulate unclassified data to produce or infer classified data. The theory was never proven, and NSDD 145 was scuttled in 1988.

Recently, the Bush administration said it will consider lifting Eastern Bloc export restrictions imposed by the Coordinating Committee on Multilateral Export Controls. The restrictions cover exports of computers, telecommunications equipment and other high-tech products.

Not surprisingly, information technology firms have applauded the administration's new stance. They assert that new technologies improving Eastern Europe's ability to communicate will further democracy, not to mention trade with the West.

Providing the Eastern Bloc with access to Western information services would advance the U.S.' political and economic agendas by helping to interweave Eastern and Western economies. Western banks and government agencies make extensive use of electronic feeds to obtain foreign exchange rates, securities prices and other statistics. To effectively work with these institutions, Eastern Bloc banks and government institutions must have access to this same data.



In the long run, access to commercial information services would allow our Eastern Bloc trading partners to build bridges to Western markets and cultures. Without information services, there is little hope that they could participate actively in global trade or relate fully to Western societies, let alone become economic allies.

Of course, U.S. information services providers couldn't just throw a switch and flood the Eastern Bloc with their electronic data. Many barriers still exist: The severe shortage of enabling computer and communications technologies and the problem of the ruble's inconvertibility are just two.

Clearly, just encouraging access to information services in the East won't do much to advance its use. That's why we need an aggressive policy to promote it within the Eastern Bloc.

Such a policy must promote East/West joint ventures and provide training and educational support to build the requisite infrastructures needed to apply the power of on-line services.

Promoting use of information services will hardly be a panacea for the many ills that plague the Eastern Bloc's decrepit economies. However, opening electronic data supply lines could become one pragmatic element in a U.S. program of economic assistance.

Marx, principal of The Marx Group in Wellesley, Mass., advises companies on business deals involving information services.

For Morris, a little time in jail just might do the trick

MICHAEL ALEXANDER

A couple of weeks back, we ran a squib in "Inside Lines" at the back of this newspaper asking readers to phone in and tell us what punishment they would recommend for Robert T. Morris.

As most people know by now, Morris is the young hacker and ex-Cornell University computer science graduate student who was prosecuted for creating a worm program and sending it coursing through a computer network.

In a matter of hours, the worm replicated to the point that it immobilized thousands of computers on Internet, the nationwide network that links computer systems at university and government facilities.

What is interesting about our informal poll is that all of the readers who responded suggested penalities for Morris that go beyond the maximum that the law allows. Many of the suggestions are not printable in this or any other newspaper.

Morris, released on personal recognizance, is slated to go before a judge May 4 in a federal district court in Syracuse, N.Y., for sentencing.

The law calls for a penalty of up to five years in prison and fines of up to $250,000. Morris could also be ordered to make restitution to those victimized by the worm.

Behind bars

In my view, only a jail sentence would be appropriate punishment. Putting Morris in jail, say, for seven or eight months, would send a signal to other cyberpunks that there are sure and certain penalties for computer-related crimes.

Among the reasons that criminal hackers use computers to engage in antisocial behavior is because they are almost certain that they will go unpunished if they are caught. Few cases are investigated and even fewer ever make it into court. We can't be certain that the threat of a jail sentence will deter computer outlaws, but there is an obvious way to find out, and that is to put more than a few of them in jail.

The Morris case has shown us that we need to develop new strategies for dealing with computer criminals, especially the youngsters. One law enforcer told me that it is no longer unusual to nab 10-year-old cyberpunks attempting to break into computer systems. When confronted, they show no remorse for their deeds.

"All they are interested in is knowing when they are going to get their computers back," said a state assistant district attorney. What is also worrisome is that they go back to carrying out the same sorts of crimes for which they were caught.

The time spent in a closet-size cell would give Morris the opportunity to ponder both the seriousness of his crime and the personal weaknesses that put him there.

When I spent several days covering the trial in January, Morris impressed me as being both exceptionally bright and sincere. In truth, I believe that he made a mistake and did not intend to discombobulate thousands of computers.

I also got the impression that Morris thought that his need to stimulate his intellect was more important than the need to respect the rights of others. On the witness stand, he seemed at times smug and self-satisfied in knowing that he knew more about computers than most.

His failing was in thinking that his work was more important than the work of the hundreds of researchers on Internet. Evidently, Morris never bothered to look beyond the boxes to see the people who use them. All he saw was his own reflection in the computer monitor.

Some people have suggested that Morris be made to do community service. Perhaps he could learn from the experience that people count for a lot more than he seems to think. Somehow, I doubt it.

I am not sure that there are lessons to be learned in requiring him to pay a stiff fine or ordering him to make restitution to his victims. One courtroom observer, an attorney, said to me that his defense must have cost the "better part of $100,000." I doubt that anything would be gained by adding to this burden.

One unusual punishment recommendation came our way from a state district attorney. He suggested that Morris should be legally constrained from using computers in his employment. "These kids have been working up to the time they can use computers in their work," he said. "We should take away from them what they have been training all of their lives to do."

Like I said, some readers suggested punishments that go beyond what the law allows. I think that such a penalty, assuming that it could be applied, would be a marvelous deterrent to other budding Morrises out there, but in this instance, the punishment is too severe in my opinion.

Morris has an uncertain future ahead of him. No doubt there will be several companies anxious to hire him for his obvious computer skills, and he will probably be able to put this whole episode behind him some years hence.

What he will never be able to leave behind, however, is the stigma of being a felon. For that, I feel sorry for him.

Alexander is *Computerworld's* senior editor, advanced technology.

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HARD TALK

Maryfran Johnson

More than a breath mint

When Digital Equipment Corp. bellied up to the bar in the land of never-say-die computing last month, the big fault-tolerant boys hardly hiccuped.

This was what competitive analysts at Stratus Computer and Tandem Computers stayed up nights *worrying* about?

Why, this puppy cost the earth but couldn't even make it tremble.

The entry-level pricetag on the VAXft 3000 was $229,000 — compared with $49,800 at Stratus and $79,000 at Tandem — and the DEC machine runs at barely 4 million instructions per second.

No sweat at Stratus; no tears at Tandem.

But hold on here. Could this doggie be a dark horse?

What if all 15,000 of those Vaxcluster sites out there wanted one? (While we're asking silly questions, what if Napoleon had had B-52 bombers at Waterloo?)

Actually, the only Vaxcluster sites likely to need fault-tolerant capabilities are in banking, telecommunications and manufacturing. The new VAX

Continued on page 30

Financial puzzle gets tricky

IBM's putting in more and more pieces, but can it integrate them all?

ANALYSIS

BY AMY CORTESE
CW STAFF

At its annual financial services industry conference held recently in Palm Springs, Calif., IBM laid out more pieces to the puzzle it calls Financial Applications Architecture (FAA).

Like the Systems Application Architecture (SAA) it is based on, FAA is a conceptual framework that IBM is filling in with products to meet the diverse needs of the financial services industry, from retail banking to trading and brokerage.

The components currently come from various IBM partnerships, with IBM planning to link them together through common standards and protocols in much the same way that it is attempting to tie together disparate operating environments and software applications under SAA. Although FAA is a superset of SAA, it also covers platforms and products not included in SAA — for instance, the AIX and OS/88 environments and IMS, IBM's nonrelational workhorse database management system.

Ahead of the pack

IBM's financial services strategy is the most advanced of its vertical market strategies, but some of the ideas applied to this industry may foreshadow things to come in other areas such as health care and manufacturing, IBM officials said.

"IBM has been losing ground in the financial industry and is trying to go vertically integrated," said Carmine Vona, executive vice-president for corporate technology strategic planning at Bankers Trust Co., a shop that spends approximately $30 million per year each on IBM and Digital Equipment Corp. systems. "The dilemma is that it will take two to three years."

In the meantime, Vona said, IBM is trying to narrow the time gap by going with ready-made products acquired from other vendors and user organizations. "IBM is going in many directions. The risk is that it won't be consistent with the base architecture," he maintained. "There are all these pieces, but will they integrate? That's where the question is."

Ray Vella

In addition to the splashy debut of its high-performance imaging system, IBM announced several new products for the financial industry, including Datatrade, a trading application for distributing data feed information; Newarc 2000, a comprehensive trading and development system available through Seer Technologies, Inc., a company created by IBM and First Boston Corp.; and two prepackaged data models to support development of applications for the wholesale and trust businesses.

Furthermore, IBM announced an agreement with Westpac Bank in Australia to explore ways of using the bank's development tools to support IBM's financial application offerings for retail and wholesale banking.

Add these to the handful of existing applications offered by IBM, and it really starts to get confusing.

IBM said it has been working on FAA for three years. "We are not able to do everything," said Mark Mauriello, manager of financial services industries strategy and planning at IBM, explaining IBM's reliance on third-party partners.

Under its long-term FAA strategy, IBM plans to have the disparate products now being offered evolve to a common set of definitions. For instance, with the recent announcements, IBM now offers no less than three application development solutions for the financial industry, not including the Westpac agreement.

However, IBM said it plans to migrate those offerings to a common set of definitions called Data Structure Series, which is built on the AD/Cycle base. IBM gave no time frame, but Mauriello said the firm "is evaluating individual models and building a plan to integrate them."

Continued on page 31

HP software forecasts system needs

BY ROSEMARY HAMILTON
CW STAFF

Hewlett-Packard Co. released a software package last week that can let customers know when their systems are no good anymore.

That would be the extreme, but HP RXforecast is intended to help users analyze their system requirements and forecast when upgrades and new systems purchases will be required.

The software is designed for the HP minicomputer platform, running either the HP Unix or proprietary operating systems. The company claimed it is one of the few capacity planning tools for a Unix environment announced to date.

RXforecast is actually a personal computer-based tool that works in conjunction with another software package called HP LaserRX. This package, which runs on minicomputers, allows users to collect and review data on minicomputer performance. The actual forecasting would be performed on a PC.

With these tools users can project future requirements, such as I/O performance, CPU usage and disk response time.

HP said the Unix version will begin shipping in September, while the proprietary version will be available in July.

The RXforecast software will sell for $3,400.

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With merger on hold, utility system withers

ON SITE

BY J. A. SAVAGE
CW STAFF

SAN DIEGO — The fastest growing utility in California is caught watching one of its systems deteriorate while it awaits a merger with another utility.

San Diego Gas & Electric Co.'s (SDG&E) energy control center is run by redundant 12-year-old Gould, Inc. 32/75 minicomputers purchased from Gould before it was bought by Encore Computer Corp. in 1989. The utility had planned to merge with Southern California Edison (SCE) in mid-1988, and itscontrol center was to be absorbed by SCE's control center.

Two years later, the merger is still on hold and may never coalesce, according to the state's public utilities commission report last month stating that the merger would not be in the public's interest.

Meanwhile, SDG&E's control systems, with a power of 2.5 million instructions per second and a proprietary operating system, are limping along with only a couple years of life left in them. The systems feed data to control-room operators in a scene reminiscent of the "war room" in *Dr. Strangelove.* Electrical energy from fossil fuel plants, nuclear power plants and other utilities is measured and directed to substations on the grid. Natural gas supplies are likewise measured and distributed.

If the merger is called off, "We've really got a problem because [upgrades] have been delayed so long," said former energy management system operation supervisor Phil Stockard.

While SDG&E has not been putting resources into its control systems, its business systems have been upgraded, including IBM Personal System/2 computers for staff and fiber-optic lines linking offices. Thus, the energy control systems appear to be the technologically weak spot for SDG&E. What the utility is faced with is "a very old operating system on a very old machine," said Ron Bushner, who took over for Stockard in December.

SDG&E's *control systems have just a couple years of life left in them*

Bushner has met with SCE officials to discuss methods of migrating the systems over to SCE's Control Data Corp.-based environment. SDG&E is currently developing special interfaces for the two systems, according to Felipe Razo, a senior software engineer at SDG&E.

To buy a little time in the short term, he is planning an Ethernet local-area network to connect inexpensive new hardware to the Gould systems. "It doesn't make sense to sit on our hands and lose [the systems capability] if the merger doesn't progress," Razo said.

Bushner said that implementing the LAN would not be difficult, but he has not yet determined how to keep security measures intact in such a configuration.

"We're very nervous about it, about hackers and viruses," he said. "Now there are only a few program consoles and no ties with the outside world. With Ethernet you can get to executives and others easily — too easily." The first line of defense will be to install the LAN only in the control systems section, he said.

While planning to eventually get rid of the Gould-based systems, SDG&E is still faced with the day-to-day maintenance of the machines, which Bushner characterized as "pretty difficult." He utilizes the 14-member in-house staff for maintenance "because they've lived with it for so long," he said.

Lots to do

Even if the merger does occur, SDG&E will have to do more than write interfaces to SCE's CDC computers. SCE is evaluating new computers for its control systems, according to an SCE spokesman, and any migration path chosen to SCE's current systems would be obsolete with a new system. SCE officials refused comment on SDG&E's potential migration, but Razo said that if the merger occurs, the current systems would be thrown out and the company would start all over.

If the merger does not occur, Bushner is faced with a dilemma from which there seems to be no timely way out. "We need a system by 1993, and we need three years to get it in," Bushner said.

Northwest Airlines flying high in clear, paperless sky

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — As Northwest Airlines Flight 2201 pulls away from the hangar after a routine maintenance inspection, it leaves thousands of pieces of paper in its wake.

Like the other 330 planes in Northwest's fleet, Flight 2201 is supported by hundreds of manuals ranging in size from 100 to 68,000 pages.

Northwest, the country's fourth-largest carrier, hopes to usher in a new way of handling this paperwork, which currently occupies a facility the size of a high school gym. Northwest has deployed a pair of document imaging systems that are moving it toward a paperless environment. With the new systems, technical engineers or mechanics can call up the appropriate manual in seconds to view text and graphics on a workstation.

The electronic publishing system from the Context Division of Mentor Graphics Corp. in Beaverton, Ore., allows Northwest's technical writers to revise manuals and input the revisions to those manuals. The imaging projects, collectively worth $8 million, also put Northwest in the lead among airlines using the magnetic media they receive from airplane manufacturers, according to Northwest officials. While the digital transfer of technical documents has become more common among airlines and their suppliers, work on a standard digital document format has yet to be completed.

Rendleman *says document imaging system saves time*

At Northwest, the search for digital document storage was sparked by its merger with Republic Airlines in Minneapolis three years ago. Republic already had a computerized, mainframe-based electronic publishing operation, while Northwest had a paper-based system.

A second incentive was Northwest's purchase of two new aircraft types: The Boeing Co.'s 747-400 and Airbus Industrie's Airbus A320.

"Airlines have received technical documentation from manufacturers on microfilm for 15 to 20 years," noted Terrence Rendleman, Northwest's vice-president of technical operations, who directs the company's 8,650 maintenance employees.

The drawback to microfilm was lack of speed, Rendleman said. Technicians spent about 20 minutes per day using the 14-year-old microfilm machines.

"With the optical system, the retrieval time is five minutes a day," said Dennis E. Shonka, network supervisor in technical operations computer development. Shonka said the on-line system should save Northwest $1 million per year in technician time alone.

The imaging system also brings a strict auditing function to the engineering changes that flow in and out of Northwest's maintenance department every week. Mechanics on the hangar floor can always have access to the correct documentation because the database is indexed according to type of aircraft, type of manual and the identification number of each plane.

Rendleman said the documentation of the Boeing 747-400 and the Airbus A320 — 80,000 pages in all — has been placed into the on-line system. Computer tapes from Boeing are converted from a binary format into the Mentor Graphics format via a software filter. However, Northwest would like suppliers to adhere to a common digital document format.

The Mentor Graphics publishing system resides on an 80-node network of Hewlett-Packard Co. Apollo Division workstations with a combined storage capacity of 20G bytes. A fiber-optic backbone links two buildings six miles apart and connects two 12M bit/sec. token-passing local-area networks.

Once finalized, the text and image data is indexed and written to a write-once, read-many optical disc, making the manuals available to the document-retrieval system. The retrieval system, from Metafile Information Systems, Inc. in Bloomington, Minn., currently sports three Compaq Computer Corp. 80386-class personal computers used for indexing and scanning and six networked retrieval PCs located in one of the major hangars in Minneapolis.

An important future direction of the on-line document system at Northwest — which is still in beta testing and running in parallel with the microfilm- and paper-based records system — will be to integrate it with the work-order or parts-inventory systems residing in the airline's two IBM 3090-200 mainframes, which can now be accessed through workstation windows.

When asked how long it would take for the mainframe and workstation applications to be wedded together, Rendleman replied, "No one has ever done that. It could take a year, or two years. Our five-year plan has it as one of the first projects."

Fly with standards

Airlines, airplane manufacturers and parts suppliers are about to touch down on a standard for digital technical documentation.

Technical standards committees from the American Transport Association (ATA), the Washington, D.C.,-based group that represents the nation's large airlines, and the Aerospace Industry Association (AIA), which represents major manufacturers of airplanes and engines, are adding a digital standard to ATA Specification 100, which governs the format and distribution of maintenance and technical documentation.

Joint ATA/AIA committees are at work on standards for automated text, automated graphics (both raster and vector) and optical disc indexing and interoperability.

Currently, vendors such as The Boeing Co. deliver technical documents in a binary format that must be converted to a format that can be read by the electronic publishing systems.

Text and graphics application profiles are planned for release into ATA Revision 29, which is due out later this year. Ultimately, electronic publishing vendors selling into the airline industry will need to adopt the ATA format.

ELLIS BOOKER

Johnson

CONTINUED FROM PAGE 27

is aimed squarely at applications in order processing, inventory management and electronic funds transfer — places where a few minutes of downtime can cost a fortune.

Like those candies that are more than a breath mint, the never-fail VAX is more than just another box.

It is a crucial piece of DEC's strategy in the on-line transaction processing (OLTP) market, where all serious players guarantee that their computers never crash. It is also a defensive maneuver to hold ground with DEC customers who might defect to Stratus.

Right now, the OLTP market hovers around $2 billion annually, and industry experts get positively giddy about its growth curve over the next decade. By the next century, OLTP will supposedly carry the same financial weight as the $60 billion fast-food industry.

But is the VAXft 3000 a threat to Stratus or Tandem? Get serious. Those folks have nearly two decades of success in this market between them, and a price/performance contest with either vendor would annihilate DEC, the analysts all agreed.

Yet DEC is prepared to sprinkle fault-tolerant boxes up and down its product line, from the desktop Microvax to the mainframe VAX 9000. Such a move would deflate Stratus and Tandem's contentions that their product lines are superior in scope and scalability.

To users, it really doesn't matter if DEC's first foray into fault tolerance is "overpriced and underconfigured," as competing vendors sniffed. It doesn't matter if the VAXft 3000's design is a "simple-minded hardware redundancy," as a few analysts snickered.

What matters to those legions of Vax-aholics is that it's a familiar old dependable VAX. No worries about software conversion costs. No strange new operating systems to learn. No staff retraining costs.

One argument holds that DEC will get away with charging such a premium price for fault tolerance because the places where the VAXft 3000 will sell are *already* wall-to-wall with VAXs.

WHEN IT COMES to snaring Ma Bell's or Uncle Sam's fault-tolerant business, DEC is still whistling in the dark.

That "plug and go" concept is one powerful marketing vehicle, provided DEC doesn't blow it. The company has something of a reputation for overengineering and undermarketing — the flip side of IBM's approach, if you will.

Then again, the analysts and the press are hearing a very customer-oriented pitch from DEC these days. Less talk about engineering excellence and more chat about "bet-your-business" applications.

Since 1983, DEC users have reaped a respectable harvest of high availability — a kissing cousin to fault tolerance — with clustered VAXs that bail each other out by switching over from a dying processor to a healthy one. The company has played on the fringes of fault tolerance for seven years already, gathering valuable knowledge about what customers need and want.

That's where the "continuum" from high availability to fault tolerance comes in.

Both DEC and IBM, which provides fault tolerance by reselling the Stratus box as an IBM System/88, are telling customers that fault tolerance is ***really*** only necessary for critical data capture.

Mundane tasks such as storage and batch processing can be done on a highly reliable system, they argue, such as an IBM 3090, the VAX 9000 mainframe or a cluster of VAX midrange machines. DEC salespeople will probably walk in talking fault tolerance but end up selling high-availability clusters.

Yet when it comes to snaring Ma Bell's or Uncle Sam's fault-tolerant business, DEC is still whistling in the dark. Telecommunications and government business require Unix these days, and all that runs on the VAXft 3000 so far is the VMS operating system.

That raises another potential problem: DEC's database management and file systems are roped into proprietary VAX/VMS-based applications, while both Stratus and Tandem are busy chasing open systems business with Unix-based applications.

When it comes to sheer staying power, however, analysts and longtime customers are betting that DEC can eventually drink everyone under the table. Cure for the hiccups, anyone?

Johnson is a *Computerworld* senior writer.

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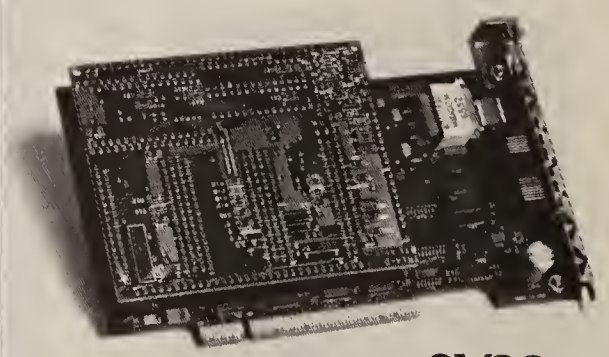

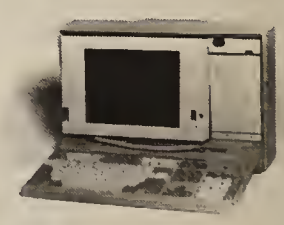

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Users see potential in real-time Access 20/20

BY MAURA J. HARRINGTON
CW STAFF

For a financial trader, the phrase "time is money" is taken to heart.

Compiling and updating information quickly is probably one of the most important aspects of a trader's job, and it typically is neither convenient nor time-effective to learn a new spreadsheet or software program, according to users. Enter Access Technology's 20/20 Realtime spreadsheet, now being beta tested in the financial trading market — one of the company's target markets, according to Michael Levinger, the firm's vice-president of marketing.

The spreadsheet has received a cautiously favorable reaction from beta-test users, in part because it is the only game in town.

20/20 Realtime is an integrated spreadsheet designed for Digital Equipment Corp.-based multiuser systems that gives users real-time data feeds, the company said. It includes features such as access to whichever database management system the DEC platform supports with the 20/20 Database Connection; trigger macros; multiple delivery modes that allow a user to perform multiple tasks such as getting updates from wire services while working on a spreadsheet; and a driver development tool kit for low-cost, customized drivers.

20/20 Realtime is one of three real-time spreadsheets presently on the market.

Bud Kroll, senior vice-president of Kidder, Peabody & Co. in New York, who has been testing 20/20 Realtime for several weeks, said, "I haven't had enough time to make an educated comment right now . . . but my initial feeling is that [20/20 Realtime] has promise."

If Kroll's traders were to use the spreadsheet full-time, it would be in conjunction with several on-line information services and in-house software programs that must be accessed throughout the day, he said.

Beta-tester Joerg Refeld, senior technical officer for the Digital Market Data Feed system at Chemical Bank in New York, said he is also testing 20/20 Realtime and is very positive about its capabilities. However, like most software programs, 20/20 Realtime does have some shortcomings, he said.

Lack of understanding

20/20 Realtime cannot read or understand Lotus macros, Refeld said, which causes a problem for his traders because so many of them use Lotus 1-2-3 as their primary spreadsheet.

"Everybody on the trading floor knows 1-2-3, but just a few of them know 20/20," Refeld said, noting that out of 250 traders at Chemical, only about six use 20/20 Realtime.

While traders currently have no other real-time spreadsheet options, Refeld said the typical user reaction at Chemical Bank is "I'm used to Lotus, but this could give me a competitive edge, so I'll learn it."

The traders' willingness to learn is positive, he said; however, competition from companies such as Lotus could mean a loss of interest for 20/20 Realtime users.

Refeld noted that Realtime 20/20 also lacks real-time graphics interfaces. "We would like to see real-time graphics interfaces. We have not seen it or worked with that yet," he said. Currently, when a change comes through on the spreadsheet, the user must update the graphic manually.

Puzzle

CONTINUED FROM PAGE 27

Similarly, the various user and customer support services offered today, such as the Officer Workbench, are expected to evolve to common Customer/User Support Services; the range of internal and external communications, such as Datatrade, will move to the Delivery and Connectivity series; and the parade of applications software, such as the Newarc 2000 and the Hogan Integrated Bank Automation, will become part of the Information series, built on a common data model.

Mann acknowledged that the task is complex and long-term: "Banks are running an application set that took 20 years to build. We're not asking them to throw that away; we're asking them to migrate."

Most large banks currently operate many distinct systems that run on various platforms, noted Robert Cameron, an analyst at the Boxboro, Mass., office of Dataquest, Inc.: "Today, it looks like bubble gum and baling wire. It is quite a feat that [banks] get them to run together."

Platforms that integrate applications software, communications and development tools specific to a particular industry "are the winning approach in banking," Cameron said, predicting that the financial industry, and others, will see more and more of this.

"An architecture is the right way to go," Vona said. However, he added, "IBM is moving exasperatingly slow. They show us the chassis and the wheels, but as a user, I want to know: When do I drive?"

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NEW PRODUCTS — SOFTWARE

System software

Graphon Corp. has released an update to its host-resident X Server software and its terminal-resident firmware.

Version 2.0 includes the backing Store and Save Under features of MIT's X.11 standard, automatic screen scrolling and additional local printer functionality. The product supports Digital Equipment Corp. Ultrix, Mips Computer Systems, Inc. and Hewlett-Packard Co. systems.

Version 2.0 is available for $395 with unlimited site usage.

Graphon
1980 Concourse Drive
San Jose, Calif. 95131
408-435-8400

Briareus Corp. has announced accounting and practice management products for use with IBM's RISC System/6000s.

The software family includes the Client Accounting and Bookkeeping System (CABS), a production-oriented client accounting system for accounting offices; the Practice Time Management System (PTMS), which was designed to handle management tasks for accounting offices; and the Modular Order Entry and Inventory Management System (MODIMS) for wholesale distribution businesses.

The base price for CABS and MODIMS is $5,000 per system; the PTMS has a base price of $2,500.

Briareus
Suite 1000
5777 W. Century Blvd.
Los Angeles, Calif. 90045
213-641-3330

Computer-aided software engineering

Interactive Development Environments, Inc. has announced an integrated, multiuser computer-aided software engineering environment for IBM's RISC System/6000.

Software Through Pictures runs on major engineering workstations and can be extended, customized and integrated with other tools to meet users' needs, the vendor said.

The software package is slated to be available for RISC System/6000 users in the third quarter. Single license prices range between $5,000 and $21,000, depending on configuration.

IDE
595 Market St.
San Francisco, Calif. 94105
415-543-0900

A computer-aided software engineering normalization tool has been introduced by Six Sigma Case, Inc.

The Canonizer automatically normalizes a database design for AT&T Unix System V-based applications.

Normalizing to the third normal form, the product creates an ANSI standard SQL script for use with Unix database management systems and provides a data dictionary containing definitions for every item in a database.

A single-user version costs $1,295, which includes 120 days of technical support, according to the company.

Six Sigma Case
Suite 210
14405 S.E. 36th St.
Bellevue, Wash. 98006
800-827-4462

Synon, Inc. has announced the implementation of a price restructuring plan for its Synon/2E computer-aided software engineering (CASE) product, which is designed to support application development efforts on the IBM Application System/400 Models 10 and 20.

The base price for Synon/2E on an AS/400 Model 10 or 20 generating either RPG/400 or Cobol/400 is now $24,000, the company said.

Versions of the software for all other models of the AS/400 will remain priced at the current level of $48,000, according to the company.

Synon
Suite 340
1100 Larkspur Lane
Larkspur, Calif. 94939
415-461-5006

NEW PRODUCTS — HARDWARE

Data storage

EMC Corp. has announced an enhanced version of its Orion solid-state disk subsystem.

The reconfigured model features dynamic channel switching on each of its directors, which enables Orion to support as many as four channel interfaces. It also provides 512M bytes of semiconductor storage and a Winchester hard disk backup unit, the company said.

The subsystem operates with IBM mainframes and compatible systems. It is priced from $52,900.

EMC
171 South St.
Hopkinton, Mass. 01748
800-222-3622

Emulex Corp. has introduced two enhanced small device interface disk controllers, each offering 1M byte of cache memory.

The QD25 was developed for compatibility with Digital Equipment Corp.'s Microvax II, and the QD25-III was designed specifically for use with the DEC Microvax 3300 to 3900 machines. Both units support host-initiated, bad-block replacement, command queuing and prioritization and seek optimization, according to the vendor.

The QD25 costs $2,895; the QD25-III is available for $3,095.

Emulex
P.O. Box 6725
3545 Harbor Road
Costa Mesa, Calif. 92626
714-662-5600

Processors

Integrated Micro Products, Inc. has reportedly doubled the performance of its AT&T Unix System V-based fault-tolerant computer.

The latest system, the XR 655, incorporates two 50-MHz Motorola, Inc. 68030 microprocessors that execute the same stream of instructions, and each can access up to 64M bytes of memory.

The computer conforms to the AT&T Unix System V Interface Definition and X/Open standards. Automatic diagnostic software is also provided. Pricing begins at $130,000.

IMP
3004 Mission St.
Santa Cruz, Calif. 95060
408-429-1338

I/O devices

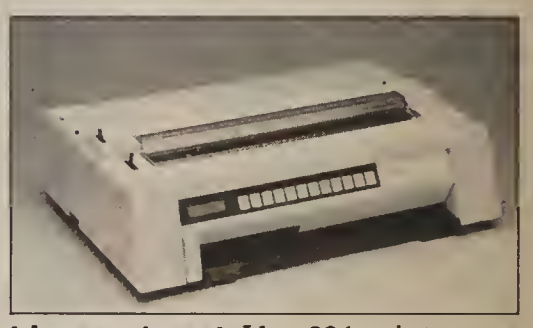
Ideassociates, Inc. has introduced its Idea 224 series of midrange printers that support IBM's Intelligent Printer Data Stream.

The series consists of four dot-matrix printers connected via coaxial cable to IBM's Application System/400 or System/34, 36 or 38 midrange units. The printers are compatible with IBM's 4224 midrange system printers.

According to the vendor, the printers offer output that can be set for draft (400 char./sec.), data processing (200 char./sec.) or near-letter quality (100 char./sec.); a 32-character LCD to define options; and various text options. The products also accommodate front-, rear- and bottom-feed operations.

The series includes a black ribbon P224-02 model, which offers 64K bytes of memory and a 400 char./sec. print speed ($5,995); a black ribbon P224-F1 with 200 char./sec. print speed ($4,195); a P224-E2 512K-byte version ($6,495); and a 512K-byte P224-C2 color printer ($6,695).

Ideassociates
29 Dunham Road
Billerica, Mass. 01821
508-663-6878



Ideassociates' ***Idea 224 printers are compatible with IBM's midrange line***

Force Computers, Inc. added two single-board CPUs to its VMEbus CPU line.

The CPU-40 and CPU-41 offer application-specific daughterboards, dubbed Eagles, which connect to VME baseboards on a Force Local Expansion Interface. The interface then connects the Eagles to a main VME board on a 270-pin connector. Both boards feature 25- or 33-MHz Motorola, Inc. 68040 microprocessors linked pin-for-pin via a cycle control chip to an FGA-002, a Force gate array.

The CPU-40 can address up to 16M bytes of dynamic random-access memory (DRAM), while the CPU-41 contains up to 4M bytes of static RAM.

Pricing for the boards ranges between $4,000 and $10,000, depending on options and production prices for the 68040 chip. A 25-MHz CPU-40 with 4M bytes of DRAM and an Eagle-01 costs $7,995. Beta-test samples are scheduled to ship in third-quarter 1990. Volume production and shipping is slated for fourth-quarter 1990.

Force Computers
3165 Winchester Blvd.
Campbell, Calif. 95008
408-370-6300

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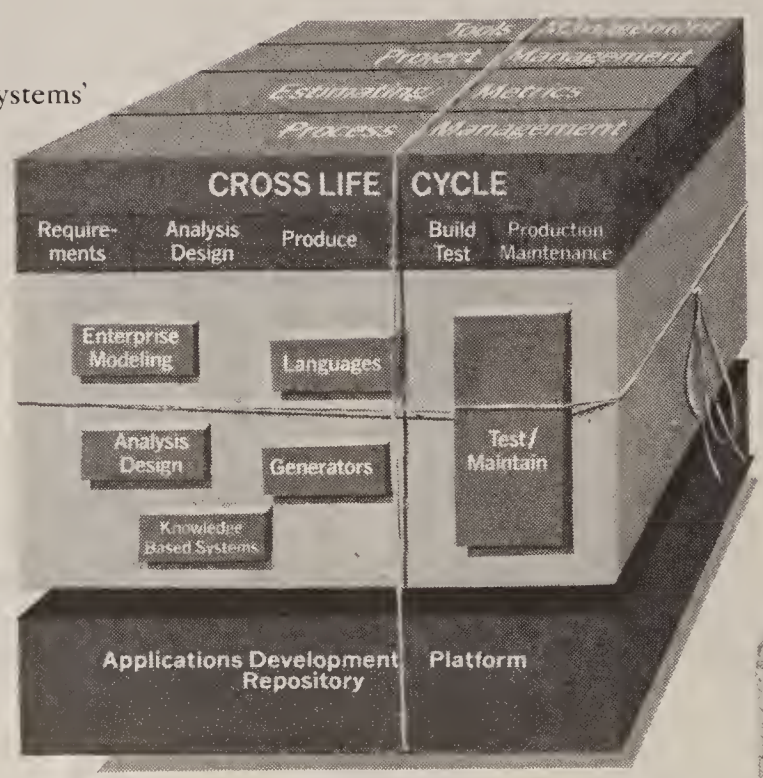

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IDC WHITE PAPER

Unix - Opening The Door To Business Solutions

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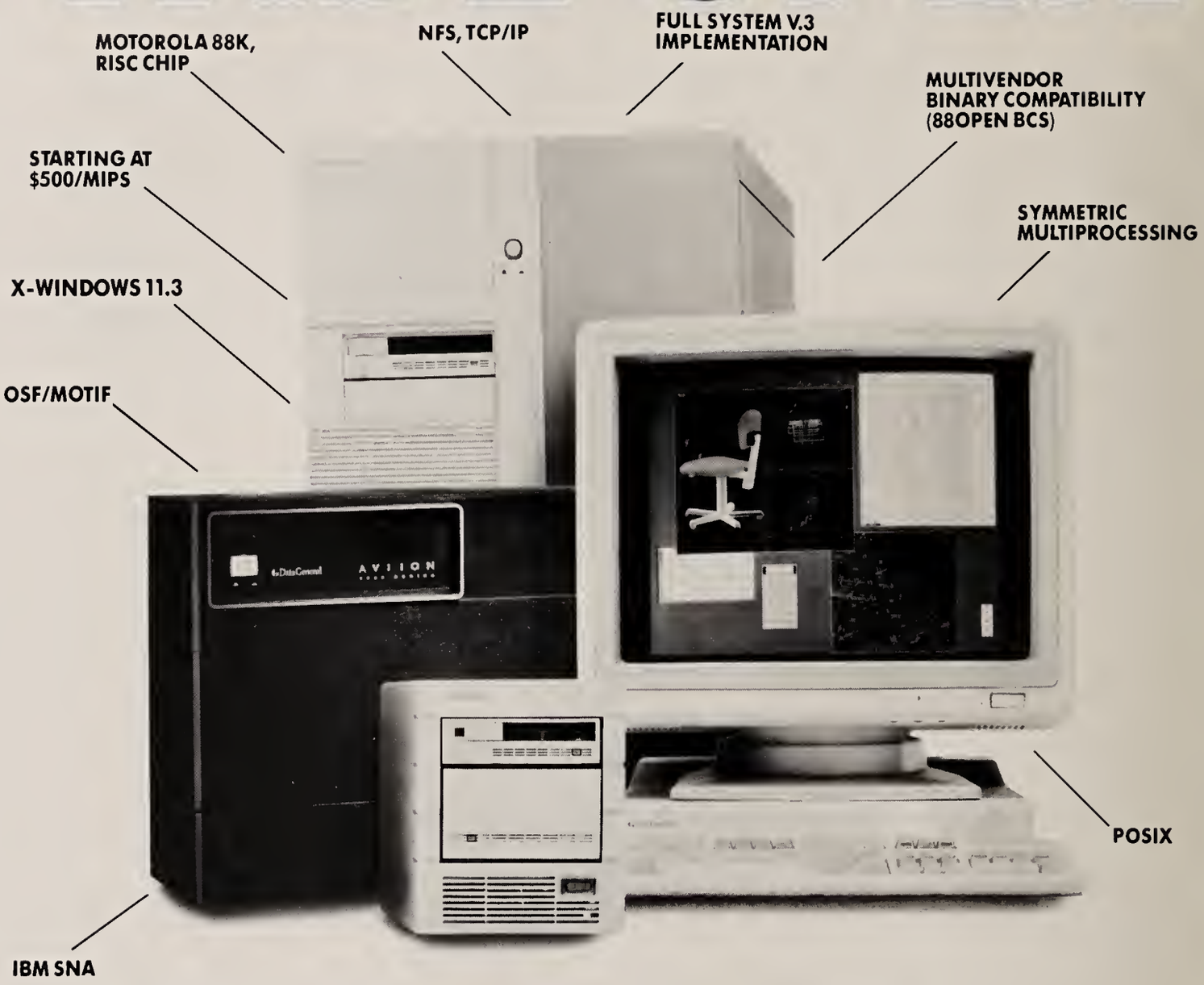

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UNIX - OPENING THE DOOR TO BUSINESS SOLUTIONS

AN IDC WHITE PAPER FOR INFORMATION SYSTEMS MANAGEMENT

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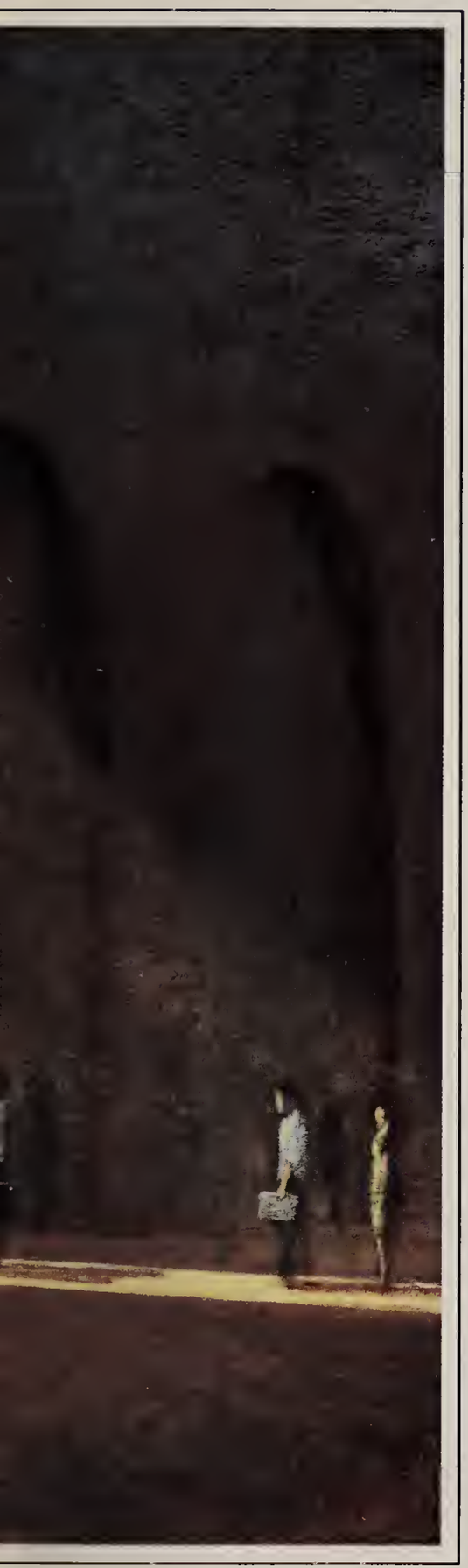
THE BOTTOM LINE: IS THE WORLD READY FOR UNIX?



UNIX

DESPITE A TROUBLED BEGINNING IN THE 1970s AND '80s, UNIX HAS BECOME A RISING STAR IN THE COMMERCIAL WORLD. INTERNATIONAL DATA CORP. (IDC) EXPECTS THAT UNIX, IBM'S MVS, DIGITAL EQUIPMENT CORP.'S VMS AND MICROSOFT CORP.'S OS/2 WILL BE THE PREDOMINANT OPERATING SYSTEMS FOR COMMERCIAL APPLICATIONS IN THE 1990s. IDC'S SURVEY OF 129 COMMERCIAL COMPUTER SITES CONDUCTED IN THE LAST TWO MONTHS OF 1989 INDICATES THAT UNIX IS USED FOR COMMERCIAL APPLICATIONS AT 84% OF THOSE SITES. AS ILLUSTRATED IN TABLE 1, THESE APPLICATIONS RANGE FROM ON-LINE TRANSACTION PROCESSING (OLTP) TO DESKTOP PUBLISHING TO PROJECT MANAGEMENT.

As a further indication of the commercial world's acceptance of Unix, 70% of MIS managers surveyed stated that they had purchased off-the-shelf, shrink-wrapped Unix solutions for their business problems.

UNIX: NOT JUST A SOFTWARE ISSUE ANYMORE

Though Unix is usually thought to be a software issue, software is only one-half of the picture. In the early '80s, few people would have believed that IBM would be selling a Unix operating system for its mainframes by the end of the decade.

As the production of open systems continues, one can expect Unix to shine. All major hardware vendors, including those that have been notoriously closed in the past, have announced versions of Unix for their platforms. Some companies have announced complete hardware lines, such as Data General Corp.'s Aviion and DEC's Decsystem, that will run Unix but will not run their proprietary operating systems. In the 1990s, IDC expects the hardware vendors to play a larger and more supportive role in continuing the Unix revolution.

While workstations and minicomputers were the traditional Unix platforms of the late 1980s, the workstation sector's growth rate has slowed down significantly. This should not be considered a sign of a slowdown of the Unix market but rather an encroachment of microprocessor-based Unix systems. IDC estimates that the growth rate of Unix in 1988, for workstations and minicomputers, was 7% and 10%, respectively. The 1988 market value for the workstation and minicomputer markets was calculated to be $2.2 billion and $1.7 billion, respectively. There is no data yet available for 1989.

With the widespread availability of Intel Corp.'s I386 and I486 microprocessor personal computers, Unix finally has a suitable hardware platform available for the desktop systems. With products such as Santa Cruz Operation's Xenix, the growth rate among Unix PCs in 1988 was 62%, compared with 19% for all PCs. This $3.63 billion market comprised 42% of the $8.53 billion overall Unix market.

As Unix gained commercial acceptance by mainframe users, the Unix mainframe market value growth rate was driven to 30%, generating a $1 billion market.

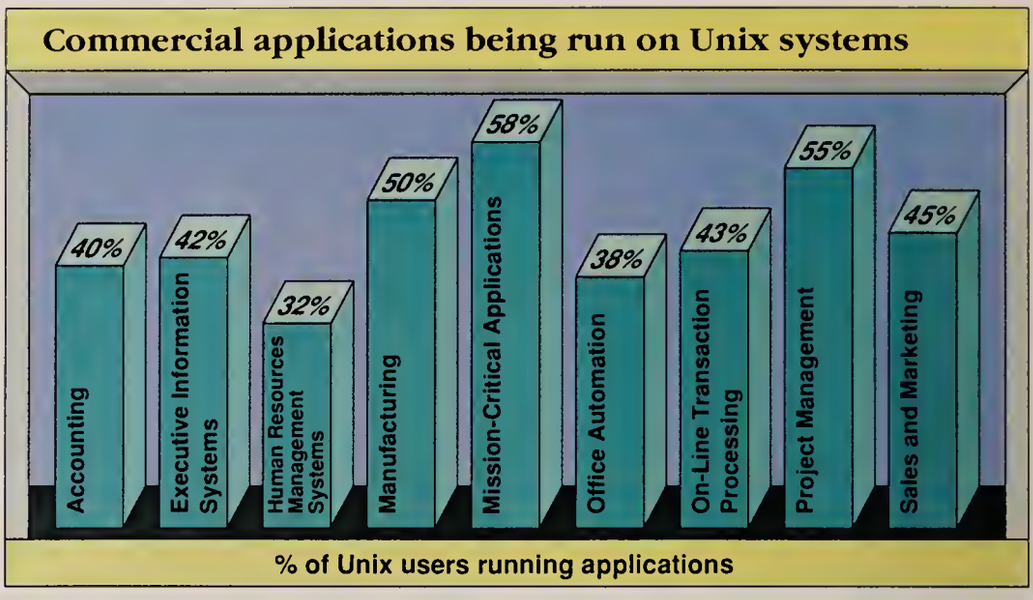


Table 1 Eighty-four percent of the 129 commercial computer sites surveyed by IDC said they are using Unix for commercial applications. Mission-critical applications were the most common, followed closely by project management.

During the same time, the overall mainframe market value grew by only 9%.

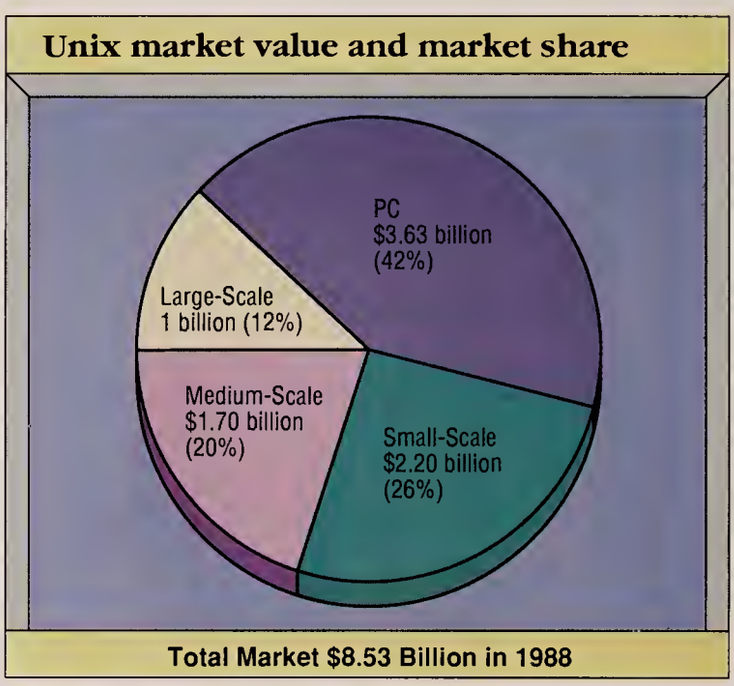
In all, the Unix market captured 10% of the 1988 aggregate computer market value. The 29% Unix growth rate was significantly higher than the 7% rate turned in by the overall computer market.

ISSUES OF 1990s

In order for a company to successfully compete in the 1990s, IDC's ongoing research has identified five areas of concern that must be addressed by the IS manager:

1. The connection and management of distributed data resources.
2. The production of OLTP systems.
3. The identification and development of mission-critical applications (MCAP).
4. The increasing use of executive information systems (EIS) and decision support systems (DSS).
5. The implementation of enterprise solutions and standards (ESS).

Each of the five elements must be successfully managed by the IS manager. The successful IS department of the '90s will need a computer system that does more than solve today's problems; it must be sufficiently flexible to handle problems that have not yet been considered. Of today's widely accepted operating systems, Unix's flexibility is unique in that it does meet the demands of today and tomorrow. Unix will continue to grow in both installed base and market share.



For 1988, IDC says personal computers dominated the Unix market in terms of market value and share of market. PCs accounted for $3.63 billion in revenues and garnered a 42% market share. After PCs, the bigger the machine, the smaller the dollar value and share of market.

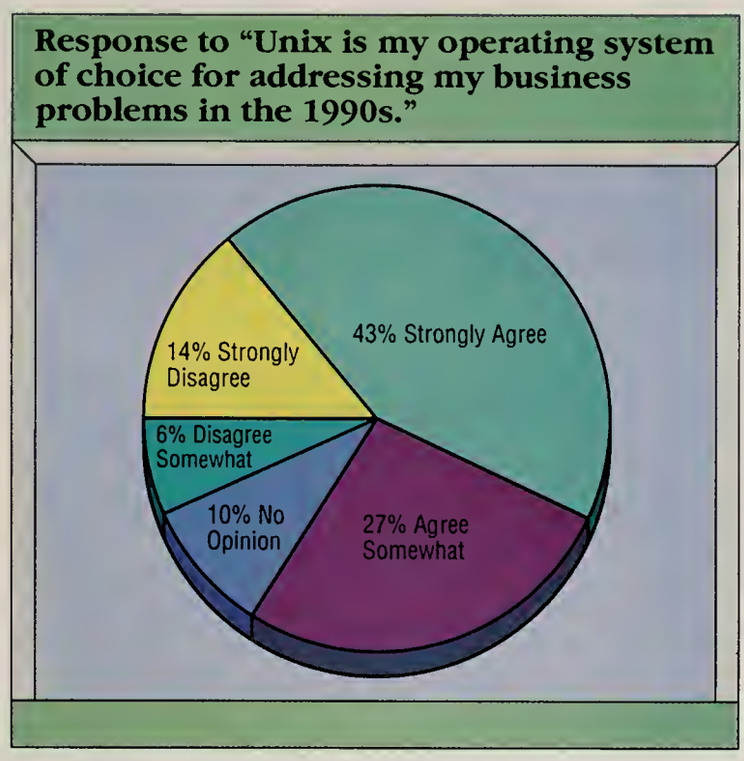
Why Unix?

Although Unix celebrated its 20th anniversary in 1989, the operating system has only been commercially supported since 1983. Originally developed by AT&T as an interactive, multitasking development system for the experienced programmer, it has evolved into a commercial-strength production operating environment.

Due to its wide availability, Unix became the de facto hardware-independent platform.

Thus, it became the paradigm of federal procurement specifications. Only one of the sites surveyed by IDC, however, indicated that federal specifications influenced their Unix purchase decision.

The driving force behind Unix is its ability to run a multitude of platforms. Because the majority of the Unix operating system is written in C, a high-level language, Unix may be ported to other platforms as soon as a C compiler is available for the target computer. Theoretically, it is then possible to take an application that was developed on a Unix microprocessor-based computer and have it run in a Unix supercomputer production environment and vice versa, with just a compile and link of the source code on the new platform.



From its relative seclusion of the 1980s, Unix is poised to take the center stage of the '90s, according to a 50% majority of those polled.

A different Unix for every vendor

Being written in a high-level language is both an advantage and a drawback for Unix. Users who bought the rights to the Unix source code could and did modify its original functionality. Because of the efforts of countless computer science students at institutions such as the University of California at Berkeley, variations of Unix were created and evolved. From the efforts at Berkeley came a succession of Unix versions, the latest being Berkeley 4.3. At the same time, AT&T also continued to enhance its Unix, releasing System V Release 4 in November 1989.

As a result of these two major versions of Unix, AT&T and Sun Microsystems, Inc., a major Unix-based workstation manufacturer, announced that they would jointly develop new versions of System V. Fearing that Sun would have an unfair competitive advantage, the Open Software Foundation (OSF) was created to develop a Unix that would compete with the AT&T/Sun product. The seven original OSF sponsors were Apollo Computer, Inc., DEC, Groupe Bull, Hewlett-Packard Co., IBM, Nixdorf Computer Corp. and Siemens AG. Since its inception, over 150 organizations have joined OSF.

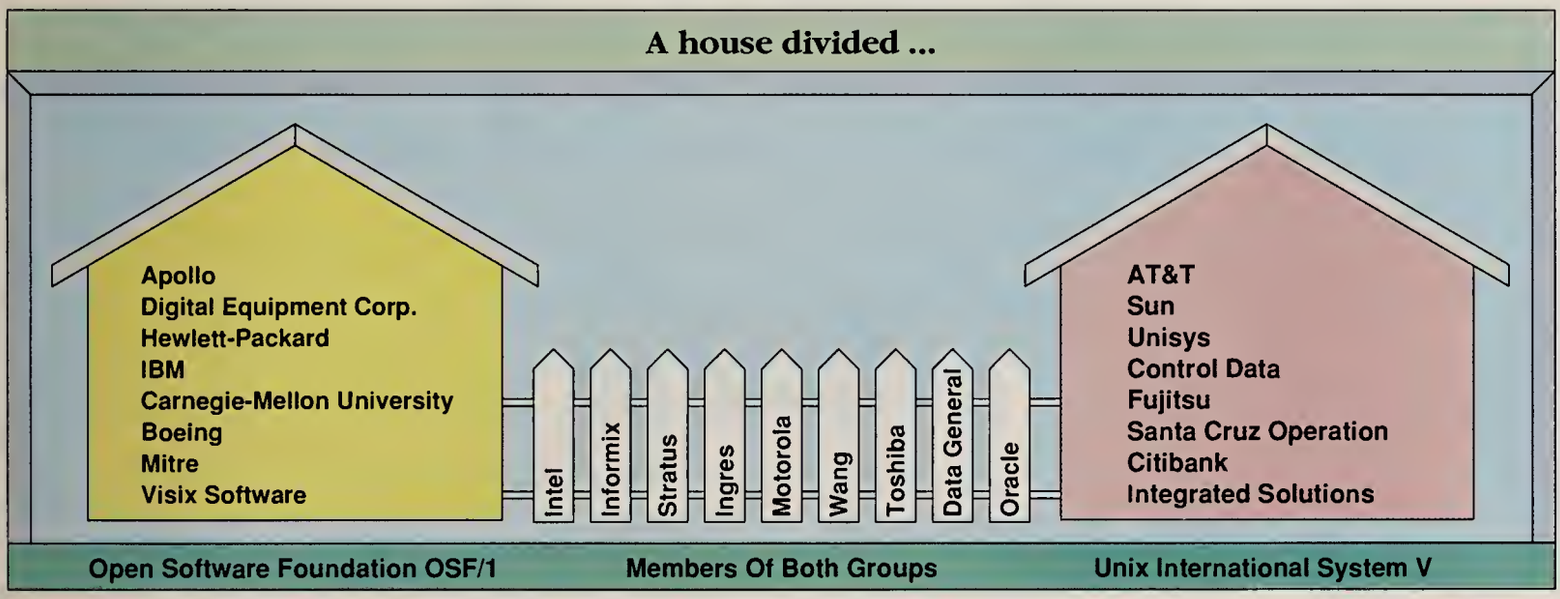
As a response to OSF, Unix International (UI) was then formed to act as an advisory panel in assisting AT&T in the ongoing development of System V. There are more than 100 members of UI, including Amdahl Corp., Control Data Corp., Fujitsu, NCR Corp., NEC, Prime Computer, Inc. and Sun.

Though the founding members of both OSF and UI tended to be primarily hardware vendors, many software vendors and end users have also joined the standards organizations. The addition of the software vendors and end users gives both organizations a well-rounded perspective in generating their final product: a Unix that meets the needs of the hardware manufacturer, the software developer and the end user, not just one special interest group.

Membership in one standards organization does not exclude one from belonging to the other group. Dual membership status is held by such companies as Data General, Motorola and Stratus Computer, Inc. among others.

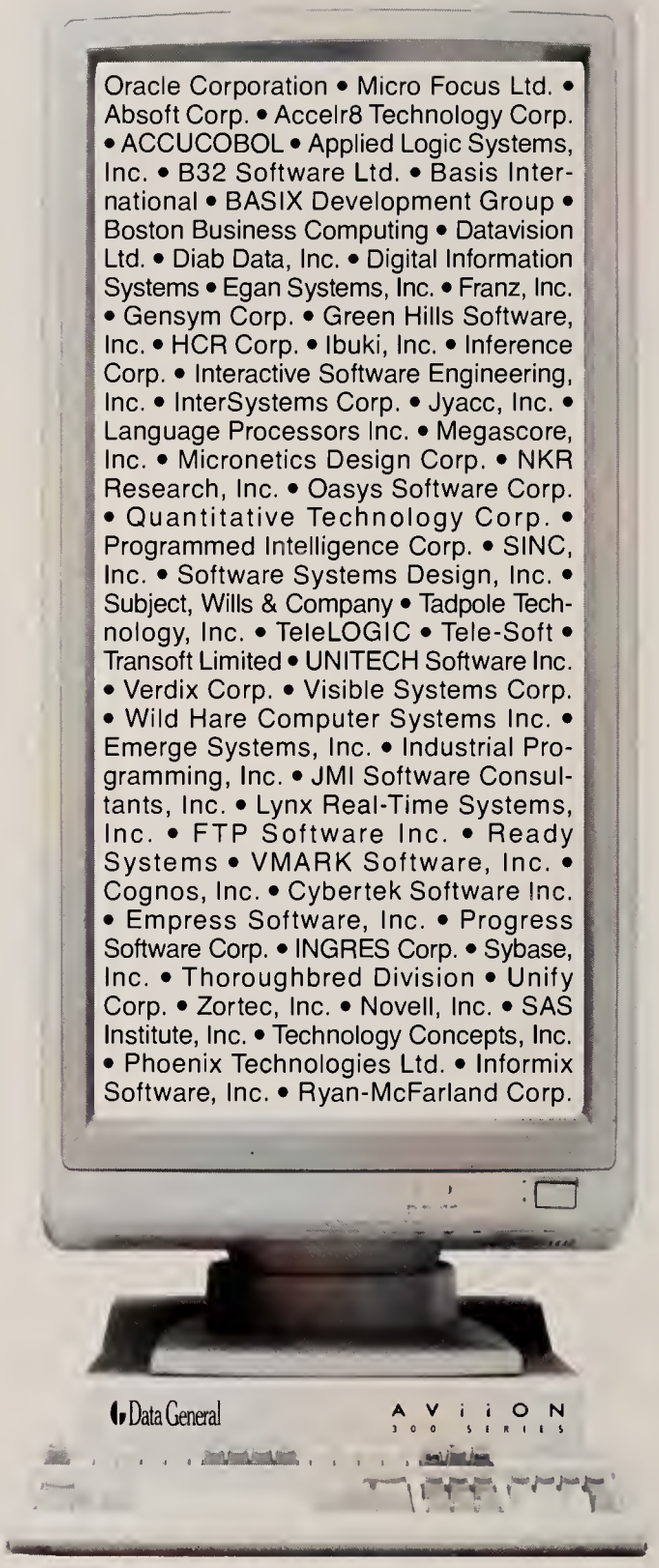
Are the conflicting standards significantly delaying Unix purchases? When IDC asked this question of IS managers, 68% indicated that the differing standards had little or no effect on their current Unix purchases. However, 25% of those polled stated that the conflicting standards were delaying their Unix acquisitions.

The respondents to IDC's census indicated that they were not really interested in what version of Unix they were running. Regardless of what version of



A house divided: The Open Software Foundation and Unix International both tried to control Unix development. Nine companies made sure that they would be on the winning team by joining both of the competing factions.

DEPTH&



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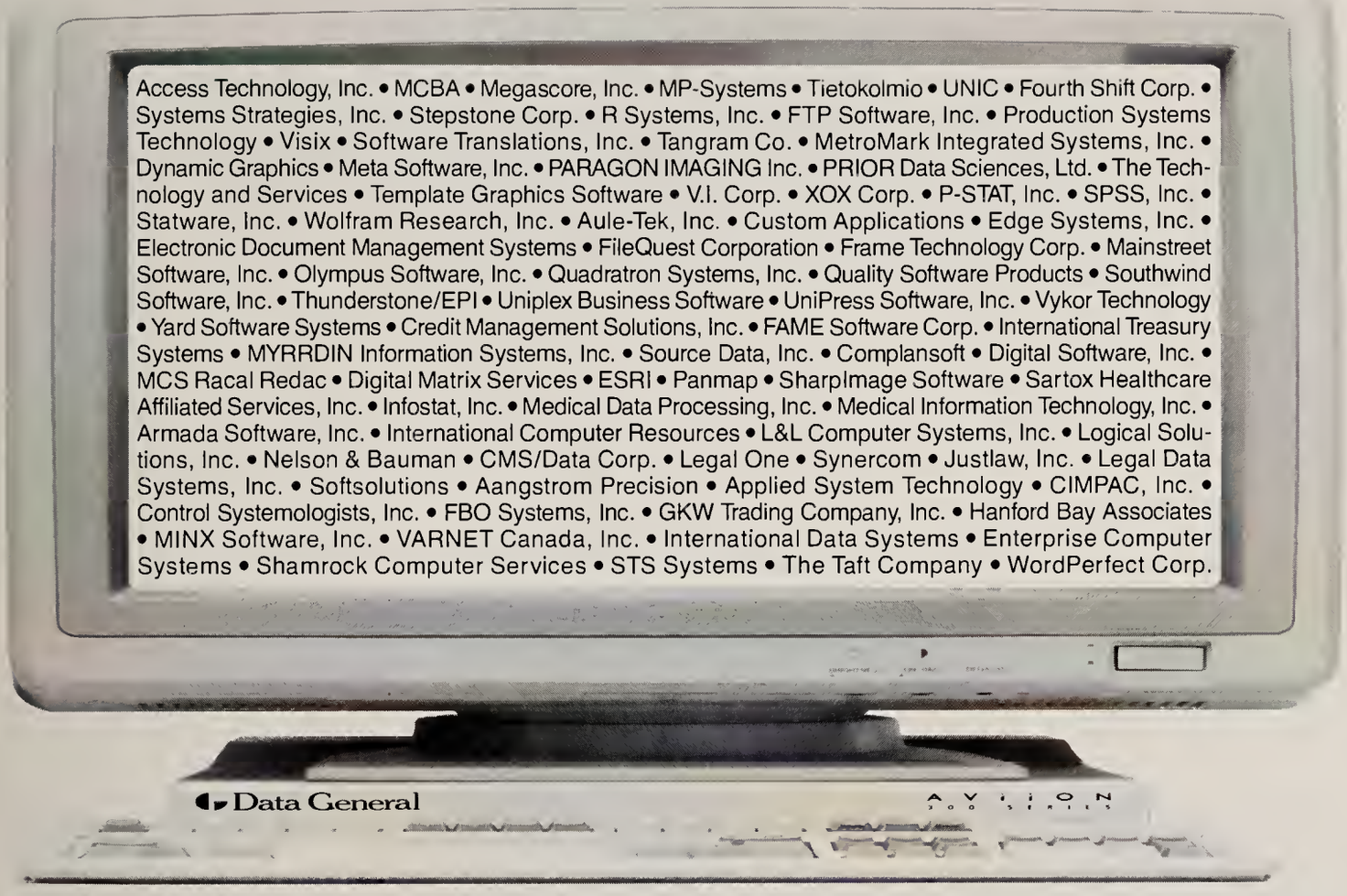

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Unix they are running, IS managers are interested in only one thing: Are there solutions to my business problems on the platform that I have chosen? IDC believes that this will be the trend of the 1990s: Sell me the solution to my problem, then sell me the Unix platform that it can run on.

Distributed Data Resources

Pity the IS manager of the '80s. Yes, the use of his computer has grown. The machine behind the glass wall has burgeoned along with his staff and budget. But as he has looked into the land of the users, he saw them leading a revolution.

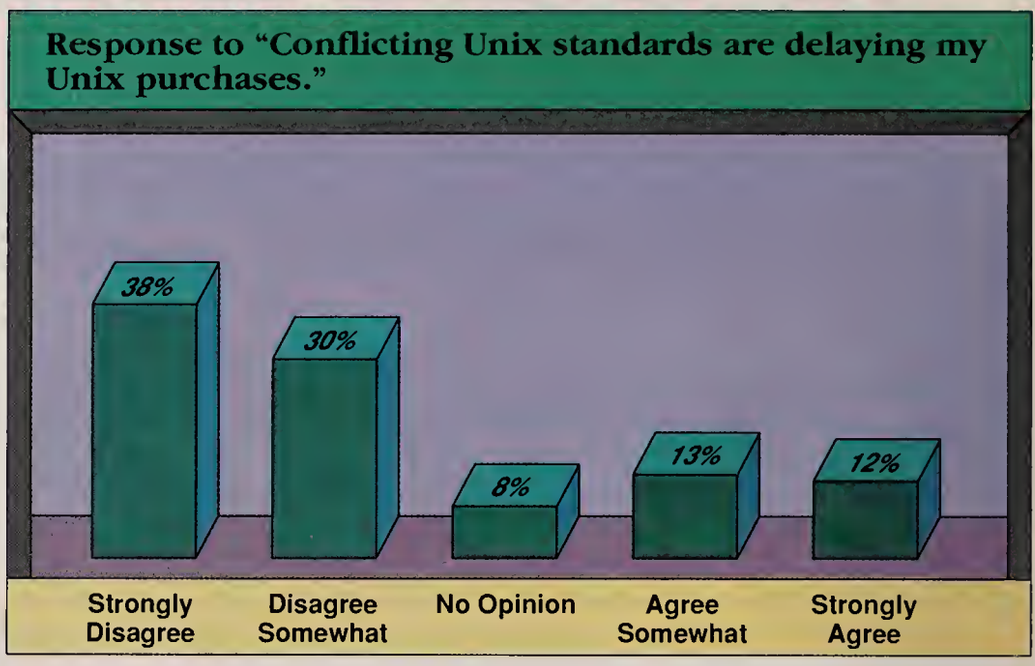
The revolution started 10 years ago, with little fanfare, as one department bought a minicomputer for some esoteric use. The IS department promised a turnaround time measured in months, while the departmental computer was able to deliver in weeks. Then another department bought a couple of personal computers for word processing and something called "spreadsheets." But since he still had a large backlog of programs to develop, the IS manager felt safe in knowing that users would eventually come to him for leadership.

As the decade continued, the departmental minis grew in capability and personal computers multiplied. Some departments went as far as hiring support personnel for their systems and installing networks to allow their PCs to communicate. Managers, particularly those from the finance office, began to notice that there were large quantities of both redundant data and resources being sequestered in each system.

The edict given to the IS manager for the 1990s is "Eliminate the redundancy." He will no longer manage a strictly centralized resource but will incorporate the glass house of his mainframe into the neighborhood of minis and PCs. While doing so, he will need to continue giving the user the power and flexibility he had in the past and refuses to give up.

No man is an island, and neither is the computer in the 1990s. As noted earlier, Unix was designed to be the great communicator. Though its original communications were with users via teletypes, it soon allowed computers to communicate via networking.

In some situations, it may be sufficient only to attach terminals to a host; other situations will demand more complex solutions. A number of workstations may be connected together in a local-area network linking a minicomputer in Hong Kong, which may in turn be connected to a New York-based mainframe via a satellite link. The workstations may be requesting digital information that is stored on both compact-disc read-only memory and conventional magnetic media, and news from live wire feeds. Unix is already in place and successfully handling these situations. IDC expects Unix to support the technologies of the 1990s and carry the commercial world into the future.

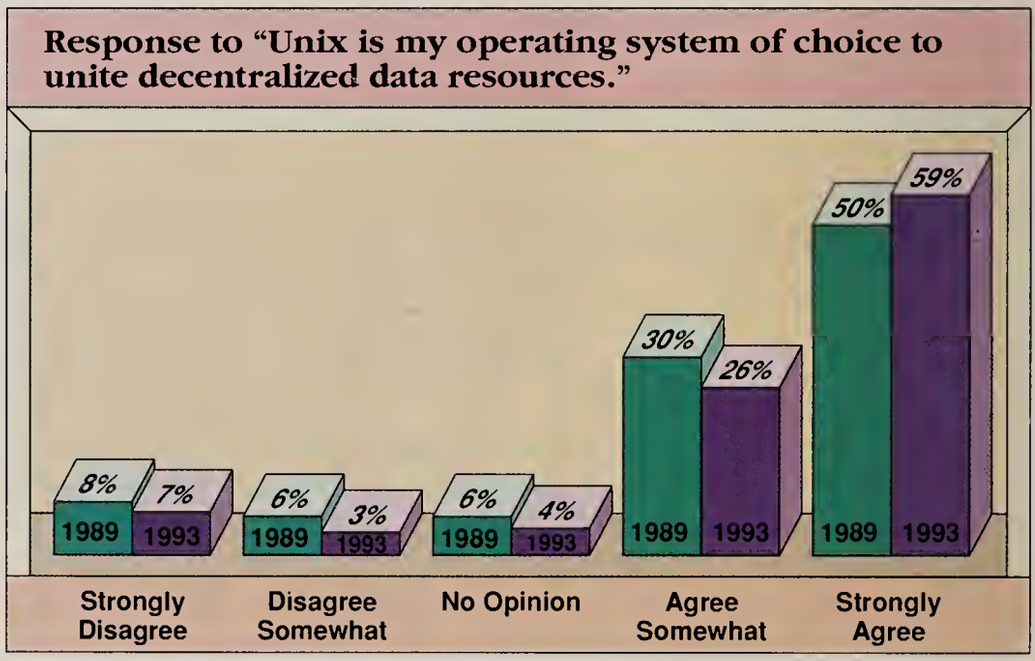


Most potential Unix users are not put off by conflicting Unix standards. More than two-thirds of those surveyed would not let the situation prevent them from purchasing.

From both the end user's and developer's perspective, a networked Unix computer system should appear to be just one machine. Therefore, as in a well-managed nondistributed system, a given piece of data resides in only one location on the Unix network. All applications needing to access the data, for example, a customer profile, will merely reference the data. In the past, each departmental computer would have maintained its own copy of the customer profile. This model would not promote high data integrity, as each system site would be responsible for maintaining the data.

Projections from the glass house

IDC's findings indicate that most keepers of the glass house have found that Unix is keeping the masses satisfied, even happy.



By 1993, almost 90% of those asked expect to implement Unix as the operating system of choice for unifying decentralized resources.

An overwhelming 80% agreed that Unix was their system of choice for unifying decentralized data resources. Only 14% did not. By 1993, 85% expect to be using Unix to tie together assorted data resources.

With the assistance of a little hardware and software, it is usually not too difficult to get computers to communicate with one another on an infrequent basis, as exemplified by the client-server model. On the other hand, it has been extremely difficult to have systems communicate efficiently enough to realize cooperative processing. Cooperative processing is the division of a large program that runs on one processor into subprograms that run on many processors. However, the division of labor requires that the different subprograms be able to communicate quickly and efficiently. Most Unix computers and network systems have been designed with this goal in mind.

Today, there are about the same number of Unix and non-Unix systems running distributed processing applications. MCAPs were the exception in 1989. Of the users running distributed processing MCAPs, only 37% were running them on distributed Unix platforms.

In 1993, IDC does not expect the picture for distributed MCAPs to change significantly. However, Unix-based OLTP distributed systems and EIS distributed systems will lead non-Unix-based distributed systems in market share. IDC expects distributed Unix-based OLTP applications to outpace other distributed OLTP systems by 40%. Though distributed EIS systems will lead by a smaller margin, their 28% lead is still impressive.

Distributed systems have existed for nearly 20 years, but they are difficult, at best, to implement. However, networking is finally coming of age for more and more shops. As Unix - one of the most powerful tools for both development and production of distributed systems - becomes accepted and develops a history with the MIS community, the corporate world can expect to see more cooperative processing systems in production.

ON-LINE TRANSACTION PROCESSING AND THE PROBLEMS IT CREATES

OLTP enables users to process a transaction and receive a response in two to three seconds 100% of the time. Air travelers use OLTP systems every day. The request for flight information, seat selection and payment via a credit card are all transactions that must be accomplished in seconds to satisfy the customer.

On the high end, American Airline's Sabre system routinely completes 2,000 transactions per second across a wide-area network. On the low end, and more typical for most operations, is the point-of-sale terminal. This system can deduct an item from inventory in one transaction and check on the customer's credit line in the next. The OLTP system in this instance may only be asked to complete two or three transactions per minute.

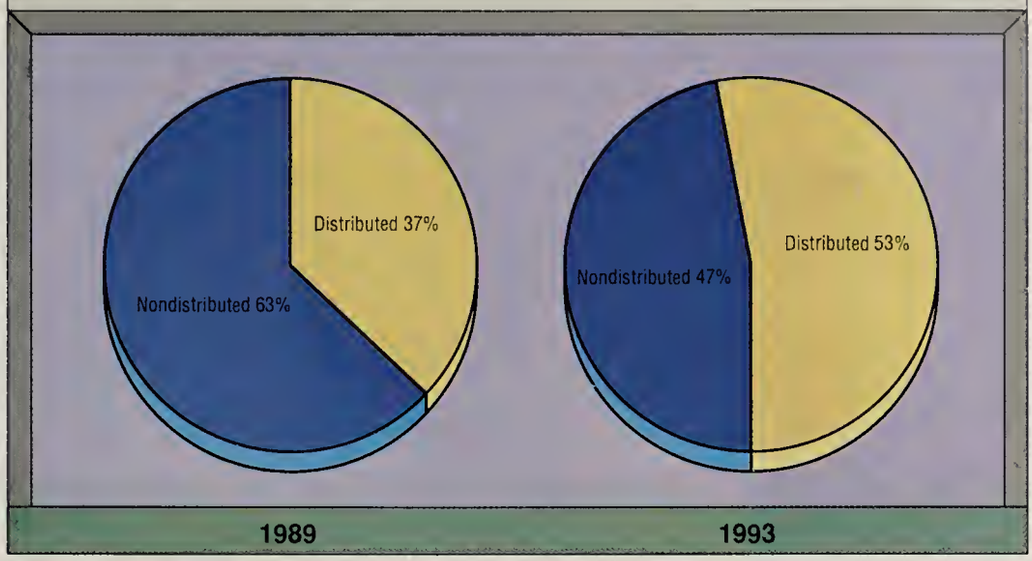
The marriage of OLTP and Unix is not without troubles, but they are capable of being mended by a good marriage counselor, such as an independent software vendor. Though off-the-shelf Unix was not originally designed for transaction processing, both independent vendors and AT&T have been able to offer enhancements to upgrade Unix's OLTP performance.

Buffers for the disk I/O

In the interest of performance, Unix maintains a buffer for disk I/O. The actual I/O to the disk is not performed until the buffer is full. If the buffer is corrupted before the data is written to the disk, the information that the application believes has been written to the disk has not been.

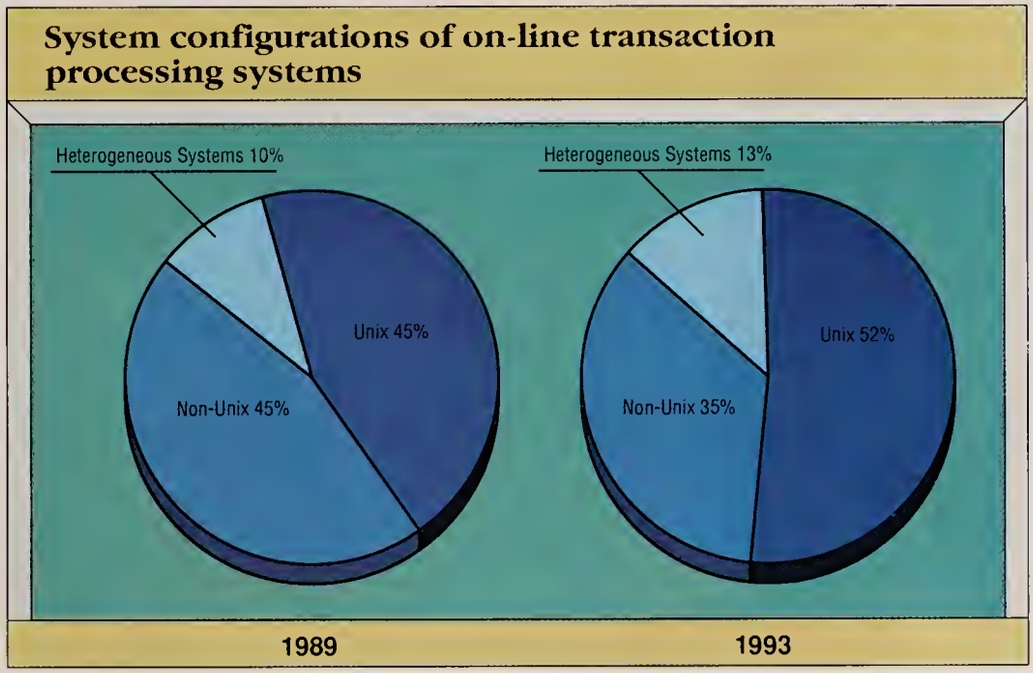
With the release of System V Release 4, write-through buffers are available. A disk

Distributed systems vs. nondistributed systems in Unix mission-critical applications



During 1989, 37% of users running distributed processing MCAPs are expected to do so on distributed Unix platforms, while 53% are expected to do the same by 1993.

System configurations of on-line transaction processing systems



Unix is forging its way into the on-line transaction processing environment. IDC projects a 7% growth spurt from 1989 to 1993.

A Data General Perspective on the Emergence of Open Architectures

Reprinted with permission of *DG Review*; based on an interview conducted between Steve Knight and Stephen P. Baxter, Vice President Corporate Marketing.

Q: As a company, Data General Corporation has developed a strong standards position very quickly. What is responsible for this change in corporate philosophy?

Baxter: I want to make sure we have a definition of standards here—it is not just communications and not just open architectures. Bringing true openness and connectivity to Data General's AViiON™ Family is a fundamental aspect of that. You can look at it on four or five levels—first, it allows R&D to develop or procure products that truly meet standards, and ensures that those standards remain inviolate. Second, from an engineering and manufacturing point of view, having industry standards like SCSI or VME busses allow us to take the latest technologies and integrate them into our system. Third, by having a commitment to standards, we allow customers to pick and choose components as they put our systems in some embedded fashion into a final solution. At the next level, it allows VARs, ISVs, master VARs and distributors to pick and choose hardware and software to integrate because we clearly define where the interfaces are in terms of standards. Finally, it gives end users the best of all worlds. Having all those attributes of openness and interconnectivity really enhances their ability to react in putting the right information systems together to solve their management problems.

Q: As computers become more of a commodity, how does Data General add value?

Baxter: You picked one of the key issues, which is how do you handle the intellectual dichotomy of adding value in a standards world? Certainly the shining example of that has to be the operating system, DG/UX™. Data General's DG/UX rigorously meets all the standards of AT&T, POSIX, etc. In addition, it has a very robust file system, symmetric multiprocessing, short-term and middle-term scheduling. What we've done is give people commercial-grade capabilities they're used to in an operating system, so if an organization decides they're going to be open, they don't have to give up all those capabilities. We give them the best of all worlds, and they don't have to give up anything to get there.

What we do is look at the value-added applications from a communications and operating systems point of view and say, "Here are ways we can differentiate ourselves over and above what's offered on the marketplace today."

One capability in terms of standards is that as a member of the 88open consortium, if someone develops an application to the only RISC-based multivendor BCS that exists in our industry (the 88open BCS), and in two years someone decides to move, they can take that application and run it—without change, without recompilation, without modification—on the other vendor's systems that (support) that standard. What we've done is make it very attractive for someone to port applications to our system because it has immediate multivendor portability. It is binary compatible; we have to clearly focus our value-added capabilities (on the) scalability of our systems, from a workstation to a multiprocessor server and higher systems. We think we can go in the standards world and focus on those value-adds, and that's where we're making our investments in R&D.

Q: There have been comments to the effect that binary compatibility is an ideal that is years away from reality. Care to comment on the accuracy of that?

Baxter: I think that opposed to giving you some nice marketing answer, let me give you a practical example of what Motorola did recently. They took an application that happened to be running on a 68000, used a cross compiler on an 88000, ran it on their machine—no modification, no recompilation, no man-machine intervention, and ran it on machines of five other vendors, including Data General's, without change. No problems—zero, zip, none.

Q: What place is the workstatian going to play in Data General's future, and in computing in general in the next several years?

Baxter: We strongly believe that more people are going to want and/or demand the kind of computing capability workstations can provide. It is overwhelmingly clear that the desktop is gaing ta be the fastest growing part of the marketplace. We think the price/performance and connectivity story of our AViiON product line, and a cost-effective PC line is how we can capture the desktop, which is one of the keys to our long-term growth. It's not just with the AViiON, it's nat just with terminals, it's not just with PCs—you have to satisfy a broad range of users wha have different needs, and you need that type af broad-range capability and perfarmance to do that and integrate all of them inta existing netwarks.

Q: Haw do you compete in the glabal marketplace?

Baxter: You have to make sure that whatever the standards are, you meet them. You need what I call a "Jacks or better" approach to play in those marketplaces. You make sure you are part and parcel of the teams that are making the standards, and you make sure you have quick time-to-market implementations of those standards. I think we have consistently shown that we are as fast, if not faster, in terms of time-to-market, concept-to-delivery of a product than most major vendors.

Q: You have a fine line to walk with your installed base and who yau're looking at as new customers far your AViiON computers—on the one hand having to convince customers that the ECLIPSE® MV/Family will be supported, that yau'll keep R&D up to a certain level, and on the other hand, putting a lot of resources inta the AViiON line. How would yau grade yourself so far?

Baxter: Those are not antagonistic strategies; they're very complementary. There are many ECLIPSE MV/Family customers who are going to be ECLIPSE MV/Family customers years from now, and for wham (AViiON) is not an issue. There are some quite large ECLIPSE MV/Family customers wha are looking taward open systems in terms of new applications, and we have a strong story in interoperability between our AViiON and ECLIPSE MV/Family lines. We think it is fundamentally easier to implement a Data General UNIX® system-based solution in an ECLIPSE MV/Family network than any other UNIX system-based solution, so we think (customers) can have the best of both worlds—if you want the price/performance and grawth capabilities of the ECLIPSE MV/Family for the rest of your natural life, that's available to you.

If there are certain situatians where open systems may be more appropriate, yau can do that with Data General. We are not spending one dollar of R&D to push a migration fram the ECLIPSE MV/Family to the AViiON Family. We're spending lots of dollars in R&D to make the interoperability story as campelling as possible.

Q: Would you care to consider what computing might laok like in five years?

Baxter: I think we'll see dramatic changes in the adaptability of the man-machine interfaces, and extraordinary transparency in client-server models. The intelligence of the netwark will allow us to look at systems of computers as a single networking entity, and the most appropriate place for the data to reside and to be run will be masked from the user, and that goes a lang way toward achieving the promise of true distributed computing. We call it Distributed Applications Architecture.

Q: Can you briefly touch on what your Distributed Applications Architecture (DAA) strategy is and how you see it unfolding in the next few years?

Baxter: There are a cauple of key aspects. First of all, it allows for very smooth interoperability in a homogeneous environment, i.e., Data General's PCs, communications, UNIX and proprietary systems working together. Second, it really plays off the capability of working in a multivendor environment in a very transparent fashion. Third, it marries various technologies such as graphical user interfaces, PCs, and ECLIPSE MV and AViiON Families and does it in a way which is technologically advanced but masks the technology from the end user. We think it's very important to smooth aver, if you will, the kinds of man-machine interfaces that exist. Lastly, DAA is truly based on standards, and having that openness and interconnectivity as a fundamental part of our strategy allaws the user to bring in whatever solution is appropriate. Any vendor who subscribes to industry mandated standards or to de facto standards can bring that (solution) into the DAA environment.

Data General

3400 Computer Drive, Westboro, MA 01580

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system with a write-through buffer is written to every time a write is requested; it still maintains a buffer for extremely fast reads. The advantage in data integrity on the disk outweighs the insignificant loss in the throughput of the OLTP system.

In addition to the write-through buffer discussed above, the disk may be accessed in "raw" mode; i.e., writing directly to the disk without using the Unix I/O system. While having the advantage of being faster than write-through buffers, raw mode has the serious disadvantage of being device dependent. This dependency wastes the key benefit of Unix: software portability. It also restricts the use of the application to those systems that have the exact hardware configuration that the application was developed on.

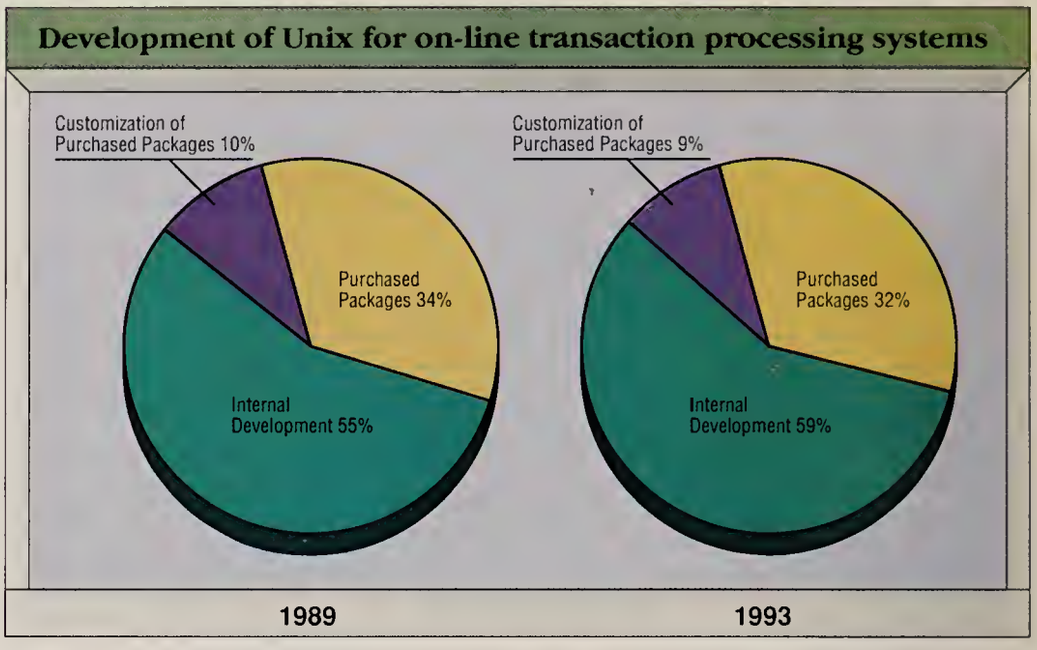
A transaction processing monitor provides a profile of system resources used by the OLTP application. The profiling data then allows the system to be fine-tuned for execution efficiency, availability and disaster recovery. Standard Unix lacks a transaction monitor; however, one is available from AT&T's Tuxedo OLTP package. Though vendors may be tempted to write their own monitor, such an effort is justifiable only for large-scale applications.

Unix/OLTP projections

A fault-tolerant system compensates for failed components, allowing the system to survive. In most cases, the work is divided among the other components. Most current flavors of Unix are not fault tolerant, but they should be. Most OLTP applications are critical to the mission of the enterprise: Any downtime for the application affects the bottom line. However, it should be interesting to watch the development of Mach, a version of Unix developed at Carnegie-Mellon University that features parallel processing enhancements. OSF has adopted Mach as the kernel for its OSF/1 operating system.

Despite the apparent drawbacks of using Unix in an OLTP environment, 45% of the OLTP sites surveyed by IDC were using Unix as their exclusive OLTP platform. An equal number were running OLTP applications on non-Unix platforms. By 1993, IDC projects that 52% of the OLTP applications will be on Unix platforms, compared with 35% on non-Unix platforms in the polled sites.

Shrink-wrapped OLTP applications present an area of opportunity for vendors. While 81% of Unix OLTP sites surveyed said that packaged Unix solutions could solve their general business problems, only 34% had actually purchased an OLTP package. For the most part, OLTP is an application field where the enterprise plans to go it alone both now and in 1993. According to IDC's survey, 55% of Unix sites are currently running internally developed OLTP applications. In 1993, that number is expected to increase to 59%. For the vendor that is able to bring OLTP applications to market, the rewards should be substantial. As a point of reference, 39% of non-Unix OLTP sites are expected to be running internally developed OLTP applications in 1990 and 1993.

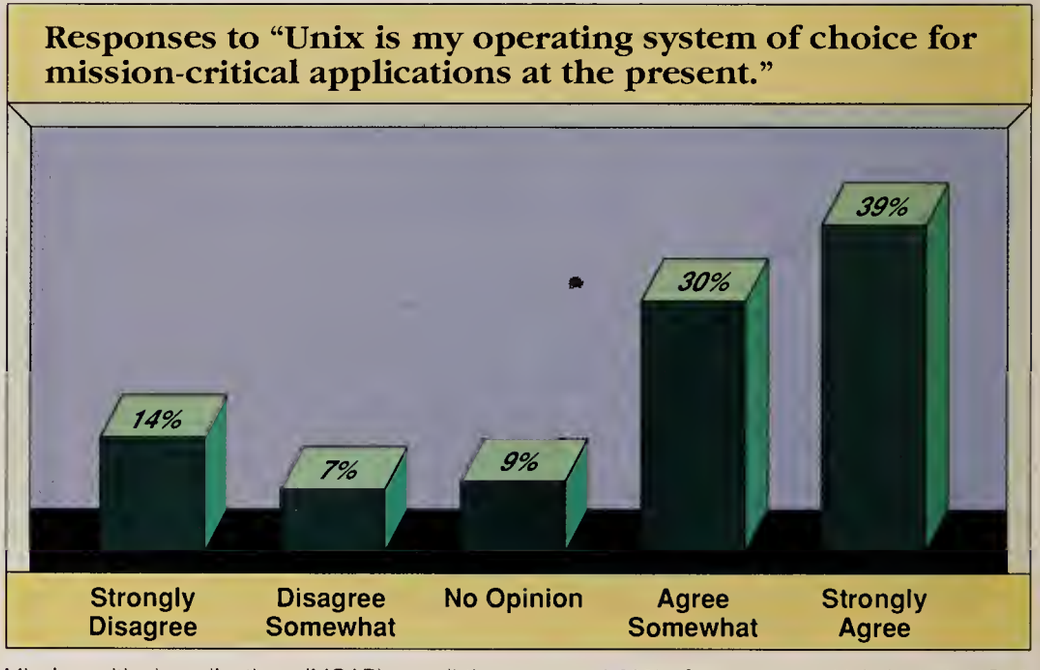


Users who favor internal development of Unix for their on-line transaction processing systems will be a growing majority between 1989 and 1993.

Presently, some 60% of Unix OLTP applications are integrated with other applications, e.g., accounting, publishing and human resources management systems. However, over the next three years, IDC believes that up to 80% of Unix OLTP applications will be integrated with both MCAPs and EIS/DSS. IDC attributes this high degree of future integration to the goal of OLTP: processing information on a real-time basis. The company that can disseminate information to both managers and employees as it is requested will not only survive the 1990s, it will thrive.

MISSION-CRITICAL APPLICATIONS: THEY COME UP AND THEY CAN'T COME DOWN

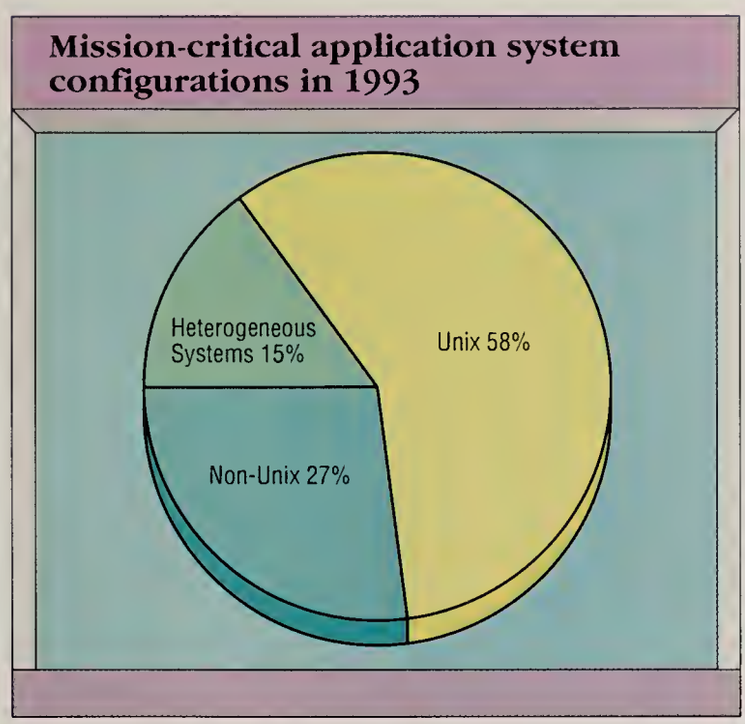
MCAPs by definition are critical to the success of the organization. They are



Mission-critical applications (MCAP) are all the rage, and 69% of users agree Unix is their MCAP operating system of choice.

usually specialized to permit the firm to exploit the niche in the commercial world it competes in. Consequently, one firm's mission-critical application may be another's prosaic application. Such is the case with payroll. While it would be an inconvenience if the payroll was to crash while in production for a manufacturing firm, it would be a near-disaster for a firm whose business is producing payroll checks.

Because the success of the enterprise lies in part on the MCAP, one would expect firms to contribute significant resources toward keeping the application on the cutting edge of technology. Evidently, they believe Unix is that technology. Of the sites interviewed, 69% either strongly agreed or agreed somewhat that "Unix is my operating system of choice for mission-critical applications in 1989." IS managers indicated that their use of Unix-based MCAPs will experience a 10% growth rate by 1993.



By 1993, 58% of those sites implementing mission-critical applications will have them running under Unix.

MCAP projections

At the sites that have implemented MCAPs, one-half of the applications have been installed on Unix platforms, while another 12% reside on both Unix and non-Unix platforms. By 1993, IDC expects the growth rate of both the Unix homogeneous sector and the Unix/non-Unix sector for MCAPs to be approximately 14% and 25%, respectively.

IDC expects that many more MCAPs will begin to incorporate new software technologies, such as expert systems. Most of these new software technologies come from research institutions, the traditional heavy users of Unix; because of this, many more corporations will accept Unix as their MCAP platform.

One of the traditional complaints about Unix is that it is not stable enough to run 24 hours a day, seven days a week. This is not reflected by the fact that 63% of MCAP installations in the survey were on nondistributed Unix systems. In placing their all-important MCAPs on nondistributed systems, the installations were wholly placing success of their corporation on Unix platforms. These companies obviously have a strong faith in Unix.

EXECUTIVE INFORMATION SYSTEMS AND DECISION SUPPORT SYSTEMS

Commercial Unix offers a new set of solutions to EIS and DSS users. These users - typically senior corporate officials and planners - require efficient systems capable of linking diverse networks and collecting information from far-flung corporate environments. Unix is finding a niche in two ways. First, cost-effective Unix systems are an attractive alternative to mainframe-based EIS and DSS systems. Second, Unix offers a possible solution for IS executives who must integrate data access across a broad spectrum of information processing environments.

EIS/DSS applications are used to improve organizational decision making. Therefore, these applications can help users translate information assets into corporate profits.

EIS and DSS come of age

Both EIS and DSS grew up in the IBM mainframe environment. Decision support packages trace their lineage to the late 1960s. Modelers and financial planners recognized that modeling packages would allow them to rapidly access and analyze corporate information stored on centralized mainframes. DSS applications grew as more information found its way to these central repositories.

Commercial EIS applications emerged in the 1980s as a response to executives' increasing requirements for faster access to corporate information in more usable formats. The evolving distributed information technologies have facilitated both the rapid access and graphical display of corporate information.

However, the same technologies that have facilitated both EIS and DSS growth will complicate the task of obtaining corporatewide information. IS managers have adopted distributed systems as a cost-effective and user-friendly solution to reduce mainframe backlog and multimillion-dollar price tags.

Distributed systems, however, mean distributed information. Therefore, EIS and DSS users need an equally inexpensive distributed capability to access and process this corporate information, a role that Unix fits quite nicely.

Vendor moves

EIS and DSS vendors recognize the emerging importance of the commercial use of Unix. DSS vendors began porting their products to the Unix world several years ago. EIS vendors are poised to follow.

Both SPSS and SAS have ported their products to Unix and are presently enjoying the fruits of their labor. Indeed, SAS's Unix product is one of their fastest growing.

Other leading DSS vendors are also preparing inroads into the Unix marketplace. Execucom Systems Corp. recently announced Paradigm, which is expected to compete heavily with Data Interpretation System from Metaphor and IBM. Paradigm offers a combination of spreadsheet, data access and presentation tools.

In the EIS arena, Execucom's Executive Edge is currently running on a multitude of Unix platforms. Also, Pilot Executive Software has announced a version of Command Center, its popular EIS package for HP/UX, HP's Unix environment. These systems will be effective in client-server environments as well as in more traditional organizations.

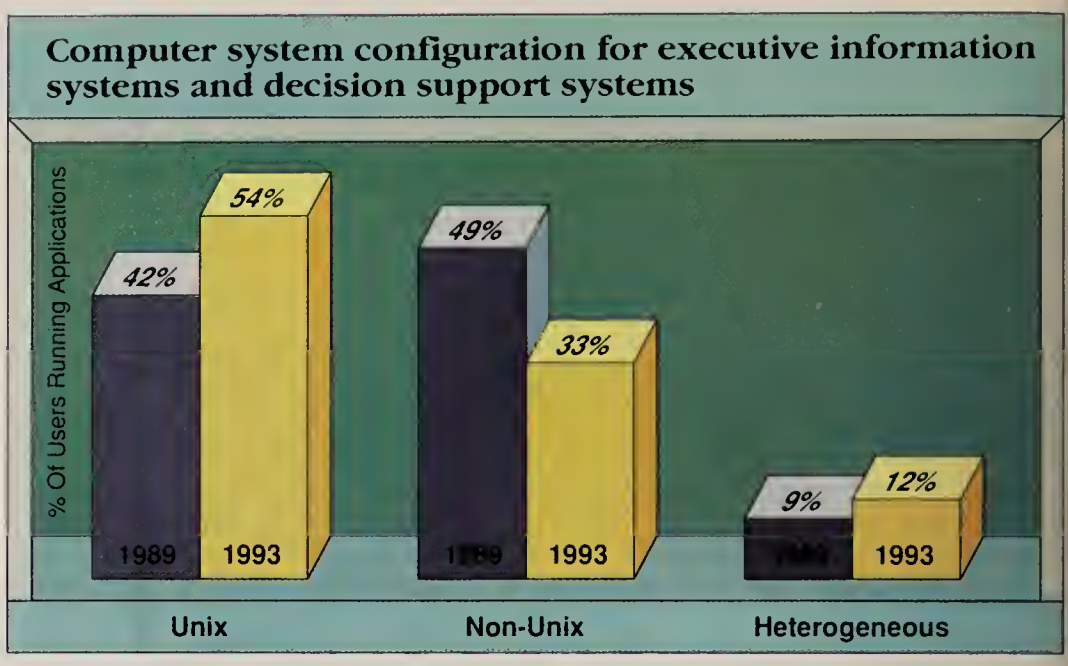
EIS/DSS projections

Although it is slowing, internal development has been and will continue to be a popular choice among those planning new EIS installations. Recent IDC research indicates that about 50% of all EISs are developed internally. The rich set of development tools in the Unix environment makes it a natural for EIS developers. Over 60% of all Unix users viewed Unix as the operating system of choice for EIS and DSS systems.

Unix's appeal as an EIS/DSS operating system is evidenced in user plans for

future systems. As the table beside illustrates, the percentage of users with EIS/DSS installations on Unix platforms will increase from 42% to 54% over the next four years, while at the same time non-Unix platforms will decrease from 49% to 33%. Commercial users with Unix experience view Unix as a strong platform for EIS/DSS applications.

Unix users are finding it easier to install EIS/DSS packages. New products from EIS/DSS vendors will significantly reduce the amount of internal EIS/DSS development in user shops. Internal development, which accounted for over 50% of all EIS/DSS installations on Unix systems in 1989, will only represent 45% of applications in 1993. Clearly, users will take advantage of new application packages for their Unix systems.



Top management will increasingly depend on Unix for their executive information systems and decision support systems.

ENTERPRISE SOLUTIONS AND STANDARDS: THE PUSH FOR COMMON INTERFACES AND PLATFORMS

Consider the challenges of having three different types of computers with seven applications from assorted vendors all running under the same roof and sometimes by the same person: 1. The function key on one application is used for help, while on another application, it is used to delete. 2. With each new computer system, both the support staff and users need to be retrained. 3. Applications from the old system have to be reengineered to run on the new system. 4. Who will support the system when the vendor no longer will? The time and aggravation you have spent solving these problems have cost your organization only one thing: money.

The implementation of ESS saves money by reducing the time and cost of procurement and training. Training costs are not only reduced at the departmental level but also at the enterprise scale. The IS department and the rest of the firm will not have to be sent away to workshops for retraining.

Large numbers of firms will continue to migrate to Unix to aid their quest for ESS. Of those Unix sites surveyed, 73% agreed that Unix has made such standards possible. Among the IS managers that have implemented Unix-based ESS, Unix was chosen over VMS, MVS, OS/2 and MS-DOS for three reasons. First, Unix is the only major multiuser, multitasking operating system available on systems ranging in size from personal computers to supercomputers. Second, Unix has very good communications and networking capabilities. Third, Unix provides a standard that is largely hardware and software vendor-independent.

However, Unix is a product of AT&T. Companies that want to modify their Unix operating system are required to buy source code from AT&T, and a license fee must be paid with every sale. Therefore, Unix is essentially a product being provided by a single vendor. IEEE's Posix defines a Unix-like operating system available from a number of software vendors; it may help move the industry away from relying solely on AT&T.

Saving money with ESS

Unix is unique in that it is an operating system supported by a large number of software and hardware vendors. Rather than being locked into a short list of suppliers, users can choose from a long list of suppliers. The greater number of competitors encourages the vendors to keep their prices down and maintain a high quality level of product and service.

ESS projections

Unix opponents continue to argue that its competing versions prohibit the operating system from being a building block of ESS. IDC's findings dispute that belief. Sixty-four percent of Unix sites surveyed agreed that they are currently able to move applications seamlessly from one Unix platform to another. Only one-fifth of those surveyed indicated that it was difficult for their organization to move applications among different Unix platforms.

IDC's research also indicates that only one application area, office automation (OA), is currently enjoying major benefits from ESS while competing standards have hindered the penetration of Unix as an effective ESS market player.

THE BOTTOM LINE

Unix is ready to accept the commercial world. Is the commercial world ready to accept Unix? Those in the know already embrace Unix as their solution to the problems facing the world of IS in the 1990s. Those who ignore the Unix phenomenon will be left behind in this new decade.

IDC expects to see a unified Unix product from OSF and UI by the end of 1993. Should users delay Unix purchases until then? No. As in the past, the joint product operating system will be backward-compatible with existing versions. Therefore, if the solution to your business problem already exists under Unix, do not delay your purchase.

Unix is the operating system that will solve the problems of the 1990s; it stands tried and tested before you today. The MIS shops from a variety of industries that have already implemented Unix-based business solutions are succeeding today and will be thriving tomorrow. △

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Court: States may tax net traffic

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — A U.S. Supreme Court ruling last week will allow states to tax interstate voice and data traffic.

With several states having already enacted such taxes and others desperately seeking new sources of revenue, the decision could raise the cost of business communications and affect the location of data centers.

The decision upheld an Illinois law imposing a 5% excise tax on interstate voice and data transmissions that begin or end in the state. Approximately a dozen states have similar taxes, and more states are expected to follow suit.

Axed with taxes
Illinois collected $142 million in taxes by mid-1987 and continues to collect revenue at a rate of $10 million per month from business and residential users, according to a court filing.

Business network managers, especially those with high-volume transaction networks such as airline reservation systems, may wind up moving their data centers to "tax haven" states that do not impose telecommunications taxes, according to experts.

"This will definitely affect site-location decisions," said Kenneth L. Phillips, vice-president of telecommunications policy at Citicorp in New York and chairman of the Committee of

Continued on page 16

Revenue enhancers
A dozen states already have some form of tax on interstate telecommunications, and more are expected to follow as a result of last week's green light from the U.S. Supreme Court

On SQL Server's test trail

BY DOUGLAS BARNEY
CW STAFF

A glaring shortage of front-end development tools and the lack of a finished product has not stopped a handful of the U.S.' largest corporations from hatching SQL Server applications.

SQL Server, announced one year ago by Ashton-Tate Corp., Microsoft Corp. and Sybase, Inc., is a multiuser database engine designed for the OS/2 operating system.

It implements the so-called client/server architecture, under which a server handles data management while users' workstations provide the interface or front end.

Users who are anxious to get cracking have been forced to buy the $1,995 Network Development Kit, which is essentially a beta-test version of the software.

Of the 800 units sold, some 200 to 250 have been snapped up by corporations, according to Microsoft SQL Server product manager Dave Kaplan.

System One Airplane Services, a subsidiary of Texas Air Corp., already has a prototype application running under SQL Server, and the results are promising, Curt L. Abraham,

Continued on page 6

NAS deal brings new lineup to plug-compatible market

BY JEAN S. BOZMAN and CLINTON WILDER
CW STAFF

SANTA CLARA, Calif. — Months of uncertainty for users of National Advanced Systems CPUs came to an end last week with National Semiconductor Corp.'s sale of 50% of its mainframe unit to Memorex Telex N.V.

After dozens of rumors about the potential sale, the deal — a total package estimated at between $300 million and $350 million — appears to guarantee continuity for customers, at least in the near term. NAS management will stay in place, and no work force reductions are anticipated, a NAS spokeswoman said. But with Memorex Telex obtaining an option to buy out all of National Semiconductor's stake at an unspecified future date, further changes could occur.

"National obviously is headed in a different direction than they were before, but we're encouraged that they kept half the company," said Richard Lester, vice-president of corporate development at Seattle-based Associated Grocers, Inc., which runs a NAS AS/XL 60 and 90/60. "We've done business with Memorex [for several years], and we're very comfortable with them."

Continued on page 8

Chip prices drop; PC prices don't

BY WILLIAM BRANDEL
CW STAFF

While several vendors used memory costs as an excuse to hike personal computer prices last year, no one is yet promising to bring them down now that the shortage is over.

According to memory-card product vendors and industry analysts, dynamic random-access memory chips are now increasingly available, and prices are dropping. Prices of 1M-bit chips are projected to plummet more than 50% by year's end.

Already, the volume purchase price of 1M-bit chips has dropped to less than $20 per chip. When the memory crisis peaked in June, the price hovered at $50 to $60. Semiconductor price trackers now project that chip prices will fall below $10 this year.

But vendors that raised system prices during the dearth — including Apple Computer, Inc.,

Continued on page 113

When the chips come down
With availability increasing, the price for 1M-bit memory chips has dropped slightly in recent months and is expected to plummet

Nov. '88	$3.85	$18.75
Dec. '88	$3.85	$18.25
Q1 '89 projected	$3.50	$15.75
Q4 '89 projected	$2.58	$8.64

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* The Wall Street Journal (1987) — "Survey of the Information Processing Marketplace."
* The Adams Co. (1988) — "Information Systems Management Study."

COMPUTERWORLD

If you're thinking of putting an IBM monitor on your PS/2, you're not seeing the big picture.

When it comes to displays, bigger is better. That's one reason why the Amdek Monitor/432 monochrome VGA has a big edge over IBM's own standard PS/2 monitor.

But it's not the only reason. Because the 432 is, after all, from Amdek. A company with over 12 years experience in the computer monitor business, and the leading independent monochrome supplier.*

The 432's 14" etched-surface, flat screen produces hardly any glare or distortion. And far less eyestrain than Big Blue's PS/2 monitor with its smaller, 12" curved screen.

What's more, IBM's smaller screen also carries a bigger price tag.

So, if you're choosing a monochrome monitor for a PS/2 or any AT compatible, remember the company that hasn't lost sight of the big picture. Amdek. **For the dealer nearest you, call 1-800-PC AMDEK.**

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MICRO BITS

Douglas Barney

Two thumbs down

A few years ago, mega-stars Warren Beatty and Dustin Hoffman teamed up on a film. It was expensively produced and heavily advertised. It was called *Ishtar.*

The movie premiered amid record hoopla and high expectations. Fans waited in line, hoping for a synergistic performance from the two stars. Unfortunately, the movie stunk.

Now, a surprisingly similar scenario is playing itself out in the microcomputer business.

Like *Ishtar*, the publicity machines raved about what was to be the combination of the century. Instead of famous actors, robust and ready back-end database management systems with mainframe resumes were to be seamlessly mated to tried-and-true personal computer front ends.

It was a user's and manager's dream come true. Without leaving the gentle confines of Dbase and Paradox, users would be able to query, manipulate and analyze data from a variety of back-end systems. These back ends had friendly, enticing names such as SQL Server and Oracle.

Continued on page 63

DRI adds graphics upgrades

BY CHARLES VON SIMSON
CW STAFF

MONTEREY, Calif. — Digital Research, Inc. (DRI), the feisty company whose CP/M operating system dominated the microcomputer business in the early 1980s, was reborn yet again recently with the introduction of a series of upgrades to its personal computer graphics product line.

New versions of Artline, the firm's illustration package, and Presentation Team, a business graphics package, will be available in the second quarter of 1990, DRI announced. The releases were accompanied by the unveiling of the firm's new logo.

"We are repositioning our graphics products as separate from our Gem systems software," said Dana Hooper, vice-president and general manager of the company's graphics business unit. "Our marketing focus has changed."

However, while analysts felt that the two products are a solid upgrade, senior management came under heavy criticism for not having a Microsoft Corp. Windows version of each product ready to go. Both packages are accessible under Windows, but neither will run as a native Windows application.

DRI's Williams *will do Windows*

In the face of charges that competitive products from companies such as Software Publishing Corp. were already Windows-compliant, DRI President Dick Williams said that a Windows product was "in the works."

"When it is ready, we will announce it," Williams said, before refusing to answer further questions on the subject.

Introduced in 1985, DRI's Gem systems software was an attempt to provide a Macintosh-like graphical interface for the IBM PC. But in the same way that CP/M was swept away by Microsoft's MS-DOS in 1981, Gem was obliterated by the Windows graphical interface.

Tough financial times followed. By 1987, when new Chief Executive Officer Williams joined the privately held company, revenue was down to $20 million, from a high of $56 million in 1985. Partly as a result of the strength of Artline and Presentation Team, as well as several operating systems products, 1989 revenue was up around $36 million, and the company said it has been profitable for about two years.

Windows wins

Bringing those applications out from under the Gem label is aimed at strengthening that trend. "We are no longer trying to push Gem as a system in competition with Windows," Hooper said. "We wanted to bring out our applications and sell them separately from Gem."

With market research and Wall Street firms pegging growth in the graphics market at between 15% and 50% per year, there is no consensus on how fast DRI is likely to grow. Williams has estimated the company will grow to $45 million in 1990.

Hooper said that while the company will continue to develop Gem, it will ultimately bring its applications out in a number of environments, including Windows and the Macintosh.

Outbound's light laptop acts as two Macs in one

BY RICHARD PASTORE
CW STAFF

If Apple Computer, Inc.'s 16-pound Macintosh Portable has you fearing a hernia, the new nine-pound Outbound Macintosh Laptop from Outbound Systems, Inc. may be more your cup of tea.

Chris Veal, a partner at the accounting firm Ernst & Young in San Jose, Calif., evaluated both the Mac Portable and the Outbound. He passed on the Apple product mainly because "it's big and quite expensive."

The Outbound machine, on the other hand, is "light and compact. It's a hell of an idea," said Veal, who has been beta testing a unit since December.

The laptop, which began shipping earlier this month, operates in two modes. As a stand-alone, it is a totable Macintosh Plus and SE compatible; when "docked," or cabled, to a host Mac on the desktop, it serves as an upgrade to the machine.

By docking the laptop to a Plus or SE, users can give these machines "a midlife kicker," said Douglas Swartz, chief executive officer at the Boulder, Colo.-based Outbound Systems.

The host Mac shares the laptop's storage and drives, and it utilizes the laptop screen as a contiguous addition. If the user drags the cursor off the side of the Mac screen, it seamlessly reappears on the

Continued on page 58

Outbound Systems' *Outbound Macintosh Laptop operates in two modes: stand-alone and docked to the host*

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Bar coding PCs ease case load

ON SITE

BY SALLY CUSACK
CW STAFF

JEFFERSON CITY, Mo. — While computer-related crime is rising, computer technology is also finding its way into the courthouse to reduce paper shuffling and streamline documentation requirements.

Carolyn Steidley, director of data processing for the State of Missouri circuit courts, said an automated data collection system is making case-by-case recording a bit easier.

"We have a pilot project that is currently up and running in five different courthouses," she said. "We're using it to document and update civil cases, and it will be expanded to include criminal data later this month."

Errors in transposition

According to Steidley, the 250 trial courts throughout the state have been collecting data manually for a number of years. "We did some tracking," she said, "and it turned up that 90% of our errors were created when numbers were transposed on case files and reports."

In a system that processes close to 200,000 cases per year, unraveling those errors can be a mighty tedious proposition. The five Missouri courts are currently using portable data terminals from Panasonic Communications

Steidley *implemented bar-code labeling*

and Systems Co. in Secaucus, N.J. First installed in 1989, the personal computer-based bar-code scanning system is reportedly saving time and reducing errors.

To revamp the manual case records system, the State Courts Administrator's office issued bar-code labels for all existing case file folders. Sequentially numbered labels were then issued for anticipated case folders and sent to the designated courthouse. Courthouse workers are also sent a bar-code menu chart for updating and classifying scanned entries.

"When a case is filed, it is immediately given a bar-code label, and the information is entered into an on-site, Zenith 286-based machine," Steidley said. "When there is any activity on the case, the clerk simply scans the menu card for the appropriate bar-coded information, such as type of resolution, action, continuance or what have you, and it is automatically updated on the PC."

From the PC, the information can be reviewed or printed, and the data is then sent on a disk to the Office of the State Courts Administrator here. There it is loaded onto a Unisys Corp. A3K mainframe running under DMS.

Variety is the spice of life

In addition to generating statistical reports on the state's civil and criminal cases, the Unisys machine is responsible for payroll processing and accounting functions, as well as an attorney identification system.

The Courts Administrator's office develops all software internally. In addition to running the software for the bar-coding system, the Zenith Data Systems PCs also run an application that is used for tracking child support payments. The software is distributed free of charge to each of the participating district courts.

While all court employees are paid by the state, all operating expenses are the responsibility of the individual counties, according to Steidley. Hardware needs will vary from county to county, she said, and the Panasonic scanners are priced at about $900 each.

Even with concerns about the dollar commitment, there are three courts already on the waiting list, and Steidley said she expects that about 20 courts will be participating in the bar-code program within the next few years.

DG jumps on bandwagon with 386SX-based portable

The hottest selling microprocessor from Intel Corp. — the 80386SX — is increasingly turning up in portables these days. Last week, Data General Corp. became the latest vendor to roll out an entry with its Walkabout/SX.

DG chose to distinguish its 16-pound luggable by underpricing its closest competitors. At $4,995, the Walkabout is $1,000 less than Toshiba America Information Systems, Inc.'s T3100SX and Zenith Data System's Supersport SX.

The 16-MHz machine features a backlit, black-on-white LCD. The screen also provides IBM Video Graphics Array resolution and offers 32 levels of gray scale.

The unit ships with a 1.44M-byte, 3½-in. floppy disk drive and a 40M-byte hard disk drive. Internal memory is expandable from 1M byte to 8M bytes. DOS 4.01, Basic and an expanded memory manager are also included.

DG rates the Walkabout's internal battery life at three to four hours. The machine features a user-definable sleep mode to prolong battery life. An optional internal modem is available for $395.

RICHARD PASTORE

Turbotax makes electronic filing a viable option

(Editor's note: We know power users, and Pete Bartolik is no power user. But with tax preparation software packages stressing ease of use, we figured someone who detests manuals and disdains tutorials was probably appropriate for this review.)

BY PETER BARTOLIK
CW STAFF

I wanted to send my federal tax return in via modem, I really did. When Chipsoft, Inc. offered the opportunity to utilize its electronic filing option, I readily accepted.

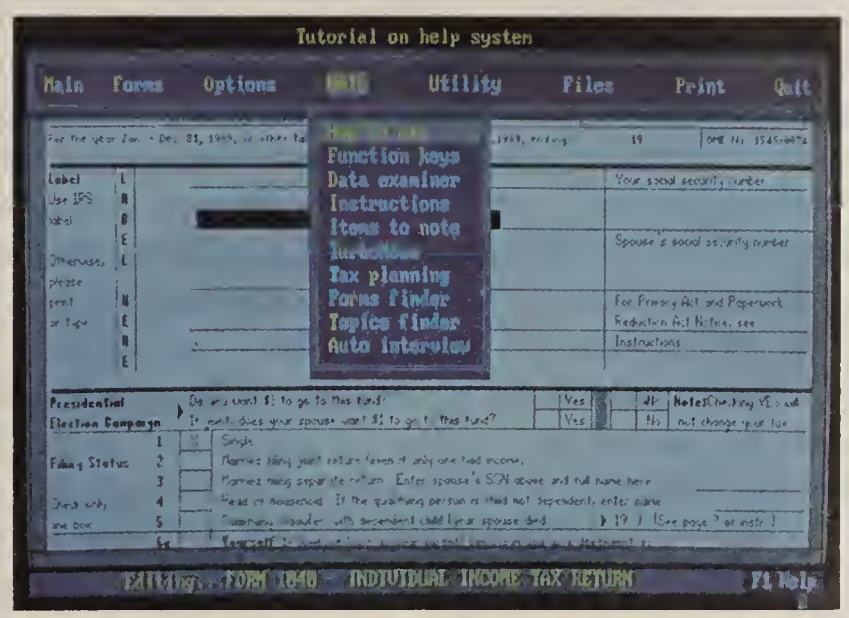
So after preparing the 1989 federal 1040 and related schedules using Chipsoft's Turbotax Personal 1040 ($75) on an AT clone, this would-be reviewer put off mailing in the usual paper forms in hopes of doing it all electronically. Chipsoft really tried, but after waiting two weeks for the Chiplink form verification and communication software ($12.50) to clear final testing, the two days I spent trying to log into a computer operated by Chipsoft's associate, Nelco, Inc., proved too much — especially with visions of that green refund check dancing in my head.

Not ready to give up on technology yet, however, and hopeful of the Internal Revenue Service's promise of a refund within three weeks, this eager taxpayer used Chiplink to transfer the electronic return to disk and mail it in with a credit-card authorization fee of $15 to Nelco, figuring the mailman was not likely to be confronted with an "unable to detect Nelcom prompt" response. Nelco, a leading tax forms manufacturer, is an independent agent authorized by the IRS to transmit directly into IRS computers.

Despite the frustrations — you still have to mail in a paper electronic filing authorization form along with a W-2 — here is one taxpayer who is convinced that electronic tax return preparation is the only way to go. Using Turbotax for the first time may not have saved me much time overall, given the experimental nature of the effort and my feeble attempts to put the software through its paces, but it certainly cut out a few tedious hours hovering over a calculator.

Turbotax did everything I expected of it and more. From the introductory questionnaire that prompts the user for information needed to identify relevant tax forms to the what-if screen that enables running out different filing scenarios to determine if there is a way to generate a larger refund, the program provides confirmation that using tax preparation software is not only more efficient but also much more enjoyable than doing it on paper.

What it also did was remove a lot of the aggravation of sorting through federal forms and booklets. A screen available at the touch of the F6 key produces a list of some 32 forms and schedules and 22 worksheets — highlighting those needed for the return in progress. Calculations flow smoothly from worksheet to schedules to the 1040 form.



Turbotax *makes filing taxes more enjoyable*

Chiplink, the communication and verification program, was easily loaded; easy-to-understand pull-down menus led me through the process of reading the tax return file from Turbotax, filling in an electronic W-2 file and building a transmission file.

In the transmission phase, the file undergoes an error-checking process to ensure that the IRS will accept the electronic file. An error message kept directing me back to line 6c(4) of the 1040, where I had entered "daughter," and informing me, "Alphanumeric fields invalid."

Several attempts to rewrite the entry and ensure that justification was correct kept prompting the same message. Finally, an IRS booklet provided a hint: It referred to various relatives but never mentioned son or daughter, only child. "Son" had passed the alphanumeric test but not his sister, even though last year's written return used the same designations. Nevertheless, changing both to child passed the error-checking process.

The most identifiable feature distinguishing Turbotax from other tax packages I have read about is that the company also offers 41 packages for state tax returns. Although it easily converted the federal file into the state return format required by Massachusetts, I am not sure it is worth the extra expense ($40), as many states require transfer of federal entries to state forms — especially if you can't align preprinted forms in your printer before running out of them.

However, the federal version certainly lives up to Chipsoft's claims. Once the software is loaded, there is little need to refer to the manual — definitely a major plus in my ratings — until you are ready to send it off in printed, disk or electronic format.

Anyone familiar with tax returns and personal computers should be able to utilize this program right out of the box. IRS instructions (except, I found, the business codes needed for Schedule C) are available at the touch of a function key. That may not be as attractive as the "expert" help available to users of *Andrew Tobias' Tax Cut*, but it was more than enough in this instance; additionally, Turbotax includes a paperback copy of *The Price Waterhouse Personal Tax Advisor.*

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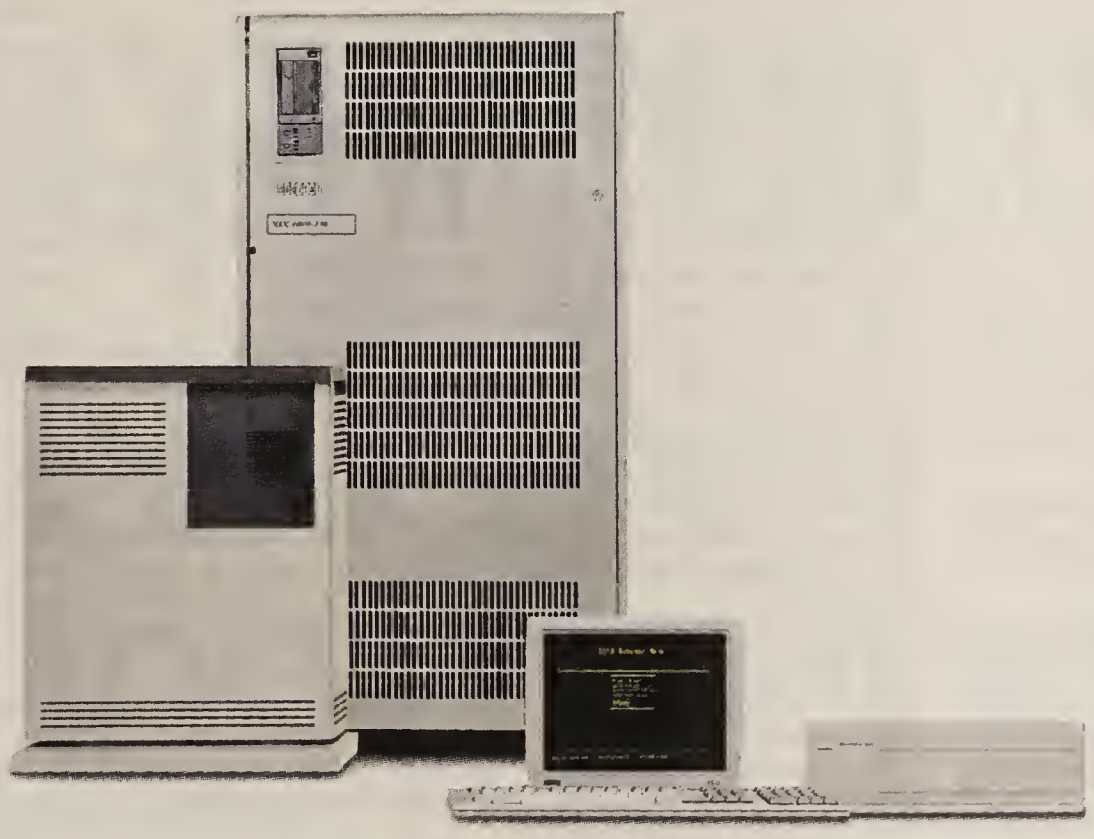

are recorded in a temporary file. If the system is interrupted, you can use the journal file to update your database to its correct state.

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Study reveals users' priorities

Although workstation prices have declined, users are still cost-conscious

BY SALLY CUSACK
CW STAFF

The workstation market is still price-sensitive despite significant price declines over the last several years, according to industry research.

A study by Strategic Focus, a Milpitas, Calif.-based research firm, showed that although users list improved processing power, graphics performance and networking capabilities as valid reasons for changing workstation vendors, most give initial price as the primary reason for making a switch. Software portability ranked second on the list of reasons to switch vendors.

Based on responses from more than 8,000 workstation users in financial application, desktop publishing and computer-aided software engineering, design and manufacturing environments, the report revealed the following:

- Users awarded the blue ribbon in the pricing arena to Sun Microsystems, Inc.'s family of workstations, which also received the second-highest rating for computation performance.
- Hewlett-Packard Co.'s Apollo division collected highest honors in computation performance and ranked second to Sun in purchase price.
- In graphics performance, HP garnered the highest rating, followed by Sun.
- Apple Computer, Inc. was the clear winner in the overall ease-of-use category.

Of respondents involved in software development, more than half said they are using X Window System on their workstations. In addition, more than three-fourths of the respondents expect to use X Window as part of their computing platform over the next two years.

Outbound

FROM PAGE 53

adjacent side of the laptop display.

The additional screen acreage allows users to have two documents up at once, work on them simultaneously and swap text or images between them using the Mac interface's Copy commands.

Outbound claimed the docked laptop will boost the host Mac's performance by a factor of two to three.

When the connecting cable is unplugged, the laptop begins living up to its name. As a portable stand-alone, it retains the Mac interface and ability to run Plus and SE applications.

While the Macintosh Portable has an integrated trackball, the Outbound machine has opted for its own answer to the mouse dilemma — an integrated sliding and rolling bar called an Isopoint.

"It takes some getting used to," Veal said of the Isopoint. "It's clearly not something you would want to use for CAD/CAM."

Not tied down

Veal said he uses his machine for on-site audits. Prior to obtaining a portable, he would carry a hard disk into the field and hope to find an available Macintosh to plug into.

With the Outbound system, "I'm not shackled to the availability of a Mac outside my office," he said.

Veal noted that several Ernst & Young staffers are interested in the unit, and the firm may consider it for purchase as standard portable equipment.

> WITH THE OUTBOUND system, "I'm not shackled to the availability of a Mac outside my office."
>
> CHRIS VEAL
> ERNST & YOUNG

Outbound chose to implement backlit, black-on-white LCD technology, which, Swartz admitted, cannot compare with the speed and readability of Apple's portable. The display's dimensions, however, are larger than that of the Plus and SE.

No docking

This is not the first portable Mac compatible to hit the streets. Dynamac Computer Products, Inc. in Golden, Colo., and Colby Systems Corp. in Fresno, Calif., both offer full-function units weighing in at more than 13 pounds. However, neither offers the ability to dock, according to Swartz.

The unit ships with either a 1.4M-byte, 3½-in. floppy disk drive or a 40M-byte hard drive. An optional external floppy drive will be available in June, the firm said.

The system can port to Appletalk networks and Apple printers. It uses an off-the-shelf, camcorder-style battery that provides up to three hours of power.

To use the Outbound system, the user must first have a dealer install an adapter board and transfer read-only memory chips from the host Mac to the laptop. This renders the host Mac unusable unless the laptop unit is connected to it.

This procedure is included in the Outbound system's price of $2,999 for the floppy disk model and $3,999 for the hard disk version.

Unify learns to speak Open Look's language

BY CHARLES VON SIMSON
CW STAFF

SACRAMENTO, Calif. — First in a market segment that is long on visibility but short on real impact, Unify Corp. last week announced the availability of its fourth-generation application development language for AT&T and Sun Microsystems, Inc.'s Open Look graphical user interface.

"Open Look is being shipped with Sun workstations, but who knows if anyone is really using it?" said Paul Cubbage, a Unix analyst at Dataquest, Inc., a research firm based in San Jose, Calif.

"The [graphical user interface] area is being pushed by the vendors. It may help Unify to be first with this interface, but I do not think the market has yet spoken."

The new capabilities will allow developers using Accel SQL, Unify's 4GL tool kit, to port a number of Unix database systems — including those from rivals such as Oracle Systems Corp. and Informix Software, Inc. — to the Open Look interface with little or no change to the underlying code.

Follow the leader

While Informix has announced that it, too, will unbundle its development tools, and Oracle and Ingres Corp. are likely to follow, Unify claims to be the only supplier of such systems at this time. Oracle, Ingres and other database management system vendors currently make their tools available with the purchase of the entire database system.

After losing its hold in the Unix database area, Unify has remained competitive by making the Accel SQL product available for all competitive databases. Accel SQL for Oracle, Ingres and Informix DBMSs have already shipped. In addition, a Sybase, Inc. version is scheduled to ship by the second quarter of 1990.

In the limelight

However, the attention being generated by graphical environments makes this area important to any independent company seeking to gain attention for its products.

"With the workstation market booming, we will certainly see increasing and able competition," said Ann Shukla, marketing director at Unify. "We feel that because we work independently of any database or interface, we are well-positioned to stay competitive with much larger companies."

Cubbage agreed with Shukla's observation, to a certain degree.

"On the procurement side, if you look at Open Look, you might now be more likely to look at Accel and, ultimately, the Unify database, which I feel technologically is better than Oracle," he said.

"It is difficult to judge how many more people will look."

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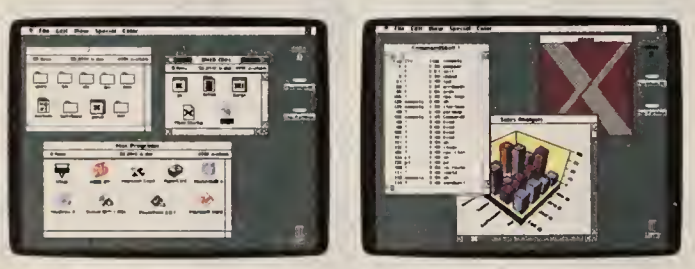

Apple's latest version of the UNIX operating system for Macintosh, A/UX 2.0, lets you run UNIX, UNIX X Window System and off-the-shelf Macintosh personal productivity programs at the same time on a Macintosh IIfx, IIx, IIcx, IIci or SE/30. 32 innovations for Apple, hundreds more choices for you.

The IIfx is, by any measure, one of the most powerful personal computers ever invented. Incorporating 53 major innovations, far too many to list here. But if you know something about personal computers, a few merit special mention:

It is the first personal computer to offer a Motorola 68030 microprocessor running at 40 megahertz. In information processing terms, this is akin to a red Ferrari screaming down the autobahn with *Ride of the Valkyries* cranked all the way up on the stereo.

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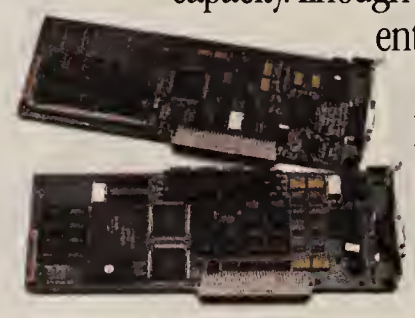


A pair of new video cards turns 18 new ideas from Apple labs into 16,776,960 more colors you can actually see. But only on a Macintosh.

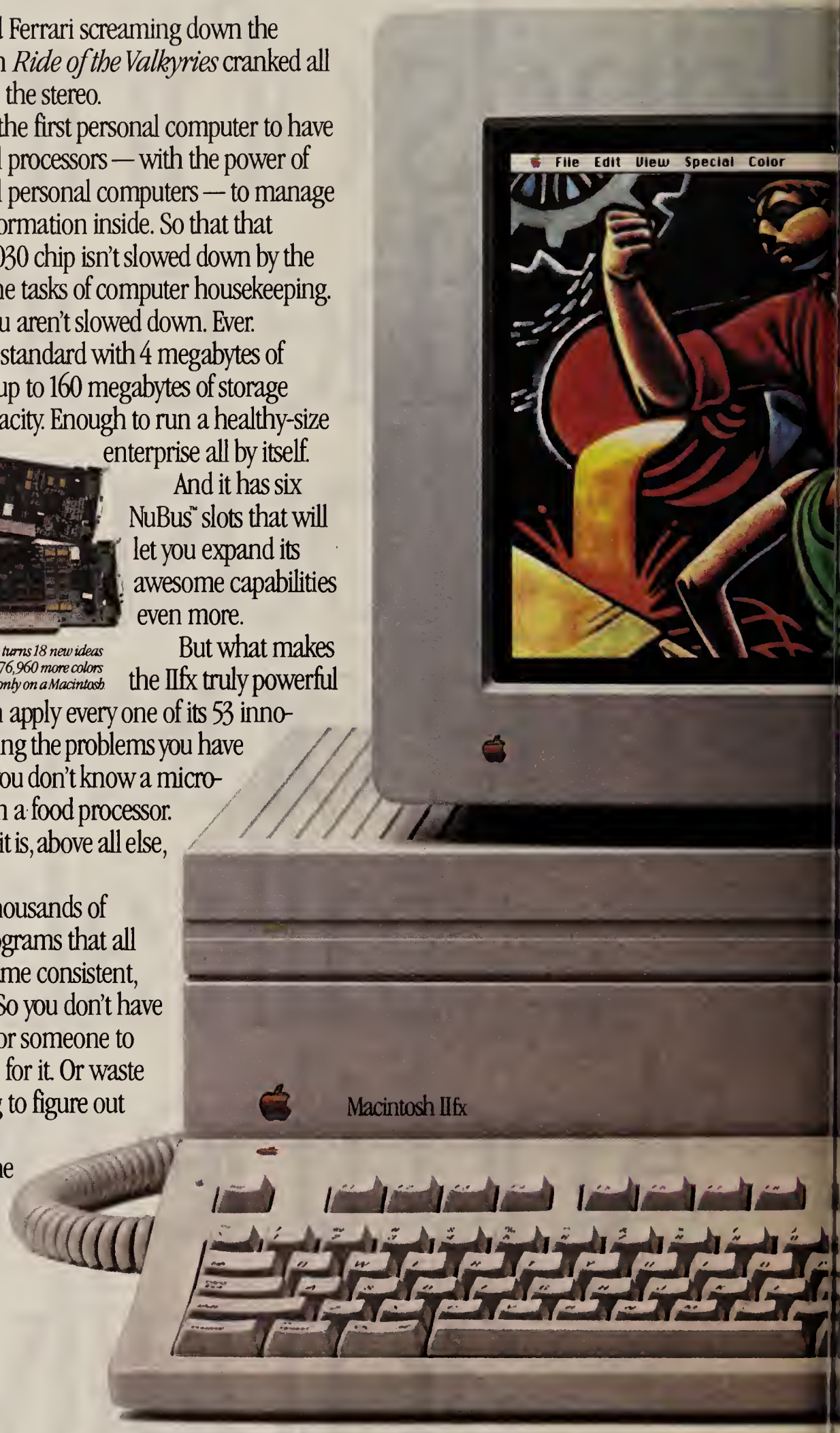
And it has six NuBus™ slots that will let you expand its awesome capabilities even more.

But what makes the IIfx truly powerful is that you can apply every one of its 53 innovations to solving the problems you have today. Even if you don't know a microprocessor from a food processor.

Because it is, above all else, a Macintosh.

It runs thousands of Macintosh programs that all work in the same consistent, intuitive way. So you don't have to wait years for someone to write software for it. Or waste months trying to figure out how it works.

It runs the Macintosh programs you already own,



The new Macintosh IIfx. Me

National Software Testing Laboratories ran benchmarks comparing the Macintosh IIfx with the IBM Model 70/486 running Microsoft Excel, Aldus Pagemaker and Adobe Illustrator. NSTL found the IIfx was 34% to 270% faster running these three popular programs, doing the things you normally do in business. In the same tests, the IIfx was also faster than the Compaq 386/33. The full NSTL test reports are available on request. The Macintosh IIfx, the two new Apple video cards and A/UX 2.0 were created for human beings by human beings. In particular: Frank Casanova II, Carol Clettenberg, Mark Gonzales, Ron Johnston, Tony Masterson, Jean-Charles Mourey and Jim Stair. And they, like all the other human beings at Apple.

03 of the latter.

too. So you can move up to its extraordinary performance level without spending thousands more for a whole new software library.

Yet the IIfx is also a powerful value. Because it costs less than personal computers that can only promise a future that Macintosh delivered years ago.

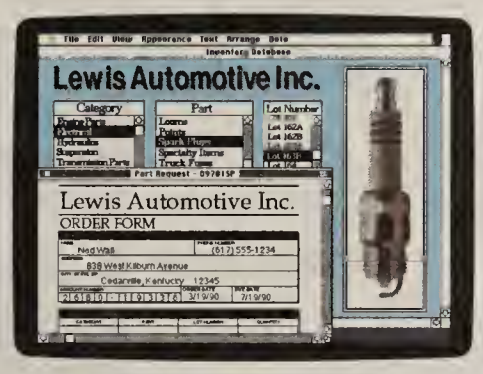
Of course, the beauty of owning *any* Macintosh is how easily you can take advantage of the latest Apple ideas.

You can appreciate the new Apple® 24-bit color card, for instance, without knowing any of the details of its 5 innovations. Just pop it into any modular Macintosh and look at the breathtaking true color on the screen. It gives you the ability, in any program, to work with as many as 16.8 million colors (roughly 16,776,960 more than you'll see on any other personal computer).

Apple's new graphics accelerator card features a total of 13 innovations. But one glance at a Macintosh screen tells you all you need to know. It can translate half-a-million spreadsheet cells into presentation graphics as fast as a senior VP can ask for them. And bring lightning speed and true color to any application, even the most complex CAD, color publishing or animation jobs.

Continual improvements in Macintosh system software (the software that manages a computer's resources behind the scenes, no matter what program you're working on) are another way we add new capabilities to the computers you already own.

Case in point: Apple's latest version of the UNIX® operating system for Macintosh—A/UX® 2.0. It not only makes the notoriously complex UNIX easier to use. It's also the only version of UNIX that lets you run UNIX programs, UNIX X Window System programs and off-the-shelf Macintosh personal productivity software *at the same time.* For Apple, it represents 32 major improvements. For people who work in a UNIX environment, it means hundreds of new choices.



The IIfx runs virtually all of the thousands of graphic, intuitive Macintosh business and education programs. So, instead of waiting years for someone to write software for it, you can apply all its power to solving the problems you have today.

*The only meaningful way to measure the power of any computer is by the performance of the people who use it. But just for the record, the IIfx blew the windows off the hottest 486 PC in overall performance tests.**

Yet A/UX 2.0 meets all the POSIX compliance standards demanded by government and large corporations.

Of course, the ultimate test of any innovation comes when you actually get your hands on it. Something your authorized Apple reseller will gladly arrange.

Then you'll know why Macintosh has the power to change the way you think about computers.

The power you buy a computer for in the first place. The power to be your best.

The power to be your best.™

ure its power by your results.

actually hope you enjoy using them. © 1990 Apple Computer, Inc. Apple, the Apple logo, A/UX and Macintosh are registered trademarks, and "The power to be your best" is a trademark of Apple Computer Inc. Adobe Illustrator is a registered trademark of Adobe Corp. Pagemaker is a registered trademark of Aldus Corp. Motorola is a registered trademark of Motorola Corp. Compaq is a registered trademark of Compaq Computer, Inc. IBM is a registered trademark of International Business Machines, Inc. UNIX is a registered trademark of AT&T Corp. Microsoft Excel is a registered trademark of Microsoft Corp. NuBus is a trademark of Texas Instruments, Inc. And Ride of the Valkyries *is a terrific piece of music the louder the better.*

The power to be your best, no matter what you do best.

From the most affordable Macintosh Plus to the new Macintosh IIfx, Macintosh gives you more power to do more things more easily than any other personal computer system in the world. The only question is, how much power do you want?

What a wonderful time to be human.

First, they tear down the Berlin Wall.

Then, Macintosh® becomes one of the most powerful personal computer systems in the world.

Humanity is in vogue. *Glasnost* is in the papers. And the computer for the rest of us has become the computer for all of us.

Scientists, engineers, teachers and students. CFOs, CEOs and CPAs.

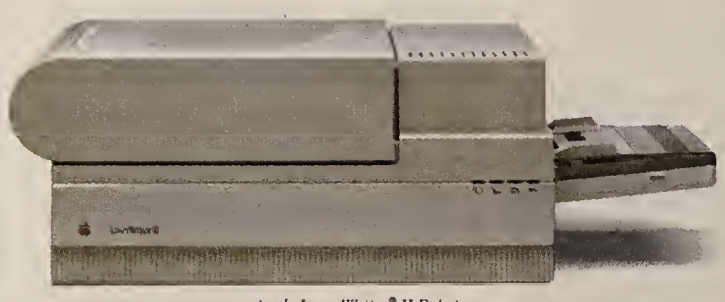
Anywhere you find people who prefer actually getting things done instead of figuring out rigid, intimidating computers.

Why, even other personal computer companies are starting to see things our way.

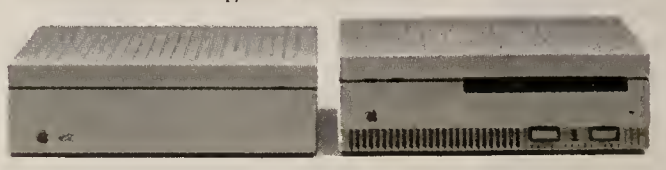
But just as you can't expect the KGB to start picking up Nobel Peace Prizes, you can't expect any other computer to work like a Macintosh.

Only a Macintosh lets you learn the basics of thousands of different programs simply by learning one. So you spend more time actually using your computer. And less time figuring it out.

Only a Macintosh offers a whole family of computers that all run the same software with the same point-and-click simplicity. So you can buy any Macintosh today, and you won't have to buy new software if you move up to a more powerful Macintosh tomorrow.



Apple LaserWriter® II Printers



Apple Hard Disk Drives *AppleCD SC® Drive*

Apple Scanner

With dozens of Macintosh "plug & play" peripherals, setting up a Macintosh system is as easy as using one. Just plug them in. Turn them on. And get to work.

Only a Macintosh gives you so much power to do so many things so easily.

Of course, just as different economic systems can work together to the benefit of both, so too can Macintosh work with the computer systems you have now: IBM mainframes, Digital VAX computers, token-ring networks, other personal computers, you name it.

And with any Macintosh equipped with an Apple® SuperDrive™ disk drive, you can even move information between a Macintosh and an MS-DOS, OS/2 or Apple II computer on a standard 3½-inch floppy disk.

Of course, the best way to understand the power of Macintosh is to sit down and use one.

Then you'll know why Macintosh has the power to change the way you think about computers.

The power everyone in the world can appreciate. The power to be your best.

The power to be your best.™

© 1990 Apple Computer Inc. Apple, the Apple logo, Macintosh, LaserWriter and AppleCD SC are registered trademarks, and SuperDrive and "The power to be your best" are trademarks of Apple Computer Inc. IBM and OS/2 are registered trademarks of International Business Machines Inc. MS-DOS is a registered trademark of Microsoft Corporation. Digital and VAX are registered trademarks of Digital Equipment Corporation.

Barney

CONTINUED FROM PAGE 53

It seemed simple enough. A single language that consisted of only 12 commands would access and manipulate the data, which was stored in simple rows and columns. It was called SQL, and the back ends that mattered already supported it. Like *Ishtar*, the PC publicity machines had us all waiting for a truly synergistic performance.

For the most part, we are still waiting. Sure, Ashton-Tate shipped a version of Dbase with SQL support. Unfortunately, it doesn't act as a client to anything. That's the stinky part.

Most of the problems have been with the PC guys. They are clearly good at marketing; they can make announcements, submit white papers on technology and convince customers that all this great stuff is worth planning for.

With typical PC arrogance, these vendors underestimated the job. They just can't seem to write the code to make it all work.

PC buyers and those who follow the business are fed up. Everything of significance that has been promised is now late.

Lotus/DBMS — whatever that is — is late. Dbase IV that works with any SQL back end is later than late. Microsoft's oft-reported Omega graphical database project isn't even the source of rumor anymore. And IBM's Officevision, the most ambitious of all client/server announcements? Haven't even seen a good demo yet (a good demo is when you get to use the keyboard).

There are many more products that are late. Fortunately, their lack of overall importance allows us to skip them. Buyers are likely to do the same.

Maybe it is just as well. Once these products do arrive, information systems executives and their database administrators will discover the flaws. Like a Yugo, these babies are bound to shudder at speed.

WITH TYPICAL PC arrogance, these vendors underestimated the job. They just can't seem to write the code to make it all work. PC buyers and those that follow the business are fed up. Everything of significance that has been promised is now late.

Client/server-crazed computer vendors are trying to cram together disparate entities. And like the critics that trashed *Ishtar*, it is about time someone stands up and says the idea stinks!

Client/server computing is a good idea. It is actually pretty radical; that is why it requires radical technology. It requires an entirely new approach in order to work properly. Retrofitting old technology is just plain dumb. Misleading users into thinking that it will work is even dumber.

I'm through waiting. I'd rather see *Ishtar*.

Barney is editor in chief of *Amiga World*.

Workstation aids nursing

BY JAMES DALY
CW STAFF

PALM SPRINGS, Calif. — Although the nursing shortage continues unabated, a newly-released workstation that can be installed only steps from a patient's hospital bed and be used to streamline mundane paperwork chores may be just what the doctor ordered, for now.

The IBM 7690 Clinical Workstation, which IBM and Spectrum Healthcare Solutions introduced earlier this month, can be installed in a hospital room for quick access. Through the use of Spectrum's Point of Care Clinical Series software, health care providers can touch the workstation's screen to retrieve or record information such as vital signs, medication records and care plans. The intended result: a higher quality of health care.

With more than a million hospital beds throughout the country, the medical automation market is an important ingredient in IBM's prescription for expansion, an IBM spokesman said.

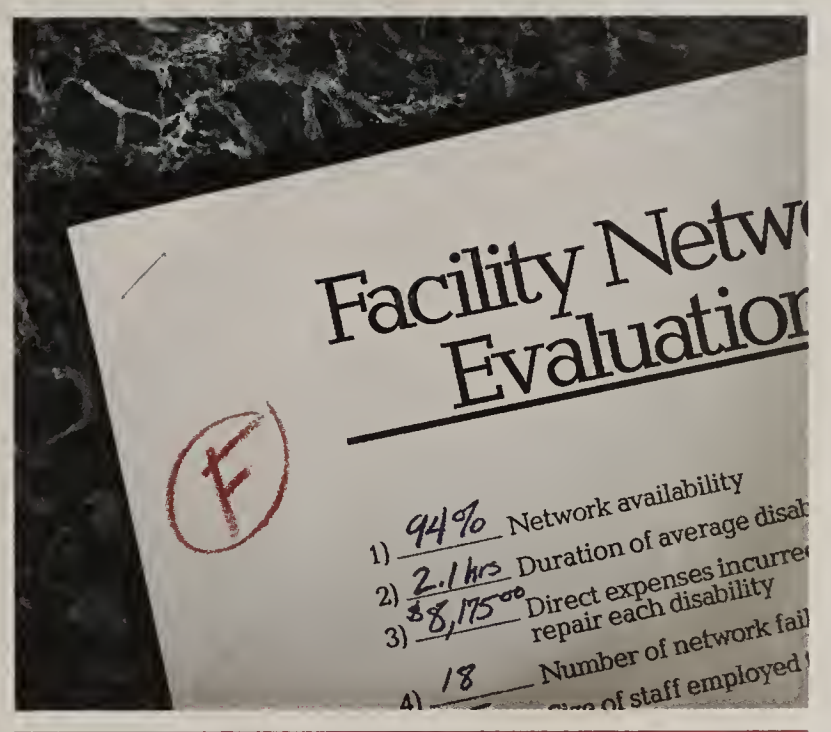
Two-point dictation

As part of that thrust, the company also introduced the Voice Management Facility/2, through which a specialist can simultaneously dictate a patient data report to a referring physician and the transcription department of the hospital.

The Clinical Workstation is priced at $4,395 and is available now. The Point of Care Clinical Series will be available in the first quarter of 1991. It will be licensed to a nursing-station file server at a base cost of $13,500.

Prices for the Voice Management Facility/2, which was jointly developed by IBM and GE Medical Systems, will range from $50,000 to $300,000 when it becomes available in May.

In networking, we think 94% is a failing grade.



A recent study shows that in large corporations, the typical facility network only operates 94% of the time.

Which means, of course, that it's down 6% of the time.

6%. You wouldn't accept that from your phone company. Or your power company.

At Chipcom, we don't think you should accept it from your network, either.

Now, you don't have to. With Chipcom fault-tolerant networking, you have a network that never lets you down. A network that is:

Reliable—Not simple fault isolation. True fault tolerance for total network survivability.

Flexible—Repairs, additions, moves and changes can be done on the fly. Without taking the network down, and without user interruption.

Manageable—Not mere network monitoring. Real-time central control for interactive facility-wide network management.

Affordable—We can show you how a Chipcom fault-tolerant network will pay for itself many times over, and how you can add it incrementally to your present facility network.

For more information, call **1-800-228-9930**.

CHIPCOM
Fault-Tolerant Networking

There's a world of distance between our

Only AT&T Paradyne can provide extension of your mainframe's multiplexer channel to anywhere in the world, with virtually no loss in performance. With AT&T Paradyne's PIXNET-XL™ channel extension products, you can access your mainframe across the ocean as fast as across the room. Which makes PIXNET-XL ideal for applications like host-to-host communications, data center consolidation, disaster recovery and remote check processing.

PIXNET-XL is also easy on your budget. Besides eliminating the need for a remote CPU, we can cut down your monthly line costs. PIXNET-XL doesn't require any increase in bandwidth no matter how far the distance. And since we have the flexibility to work with your existing hardware and software, getting

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channel extenders and everyone else's.

started is economical too. Not to mention fast.

PIXNET-XL products support a number of configurations, plus a wide range of speeds and facilities, including analog, satellite, fiber and T1/E1.

To get your mainframe to go to the ends of the earth, call your AT&T Paradyne Account Executive or **1 800 482-3333, Ext. 302.** In Canada, call **(416) 494-0453.**

AT&T Paradyne

NEW PRODUCTS

Data storage

Atlas Technology, Inc. has announced an add-on memory enhancement system that can be installed in an IBM Personal Computer AT, XT, 386 or any compatible equipped with 640K bytes of base memory and a Color Graphics Adapter or monochrome graphics adapter.

The Atlas Technology Memory Enhancement System combines its 64K bytes of base memory with 640K-byte systems to create a total base memory of 720K bytes.

It is available with initialization software and documentation complete with all memory chips for $149.95.

Atlas Technology
3900 Montclair Road
Birmingham, Ala. 35213
205-871-9555

Pacific Micro has announced the PM 1.44, an external, 3½-in., small computer systems interface (SCSI) floppy drive and the PM HDE, an external SCSI hard disk enclosure for the Next, Inc. Next computer.

PM 1.44 was designed for data transfers and software distribution for the Next computer, the vendor said. It can also be used for data transfers between Next and MS-DOS and Next and Apple Computer, Inc. Macintosh computers.

PM HDE can support either one or two Next hard disks as well as any combination of 330M- or 660M-byte hard drives up to 1.32G bytes.

Both drives have a retail price of $995.

Pacific Micro
201 San Antonio Circle C250
Mountain View, Calif. 94040
415-948-6200

Macintosh products

Radius, Inc. has introduced the Radius Pivot Display System, a graphics display system for Apple Computer, Inc. Macintosh computers that provides portrait (vertical) and landscape (horizontal) orientations in one display.

One twist rotates the display 90 degrees, enabling users to switch from full-page portrait orientation to full-page landscape orientation. During a reorientation, a position-sensing device signals a pixel rotation engine to rotate pixels at a 51.27-MHz rate, the vendor said.

The Radius Pivot Display System *rotates 90 degrees with one twist*

The system is composed of Radiusware Pivot system software and a Radius Pivot Interface ($695), which provides users of Macintosh SE/30 and Macintosh II computers with Pivot's dual-orientation capability. A Radius full-page display interface ($595) configures the display for portrait-only operation, and a Radius Gray Shades Upgrade Kit ($150) upgrades the Pivot display from four to 16 shades of gray, the vendor said. FPD interfaces are available for the Macintosh Plus, SE, SE/30 and II computers.

The Radius Pivot Display System has a suggested list price of $1,690.

Radius
1710 Fortune Drive
San Jose, Calif. 95131
408-434-1010

Systems

Vermont Microsystems, Inc. has announced a graphics subsystem for use with Interleaf, Inc.'s PC Viewstation.

The Page Manager Series 7 subsystem includes a 16-in. by 16-in. monitor with 768-pixel by 800-pixel resolution and a noninterlaced display with a horizontal scan rate of 76 KHz and a 70-Hz refresh rate. The product supports full-page what-you-see-is-what-you-get displays for PC Viewstation use.

The list price for the subsystem is $1,795.

Vermont Microsystems
11 Tigan St.
Winooski, Vt. 05404
800-354-0055

Reference Technology, Inc. has announced Reference Set, a compact disc/read-only memory (CD-ROM) development data preparation and delivery system.

The system consists of Reference Bench, a data preparation workbench for capturing, converting and indexing data to be placed on CD-ROM discs; a CD-Simulator system for simulating and optimizing a CD-ROM application; and Reference Book retrieval software for accessing data distributed on CD-ROM discs, according to the vendor.

Pricing for Reference Bench data preparation tools begins at $12,000, and the Reference Book retrieval software can be licensed for as low as $15 per replica.

The CD-Simulator costs $19,000.

Reference Technology
5700 Flatiron Pkwy.
Boulder, Colo. 80301
303-449-4157

Development tools

Data Access Corp. has announced a software package that provides interoperability of applications and databases residing on dissimilar computers and operating systems.

The Dataflex Revision 3.0 includes client/server architecture and IBM's Systems Application Architecture-compliant object-oriented user interface management system enhancements. The product enables application developers to use an object-oriented interface to create or modify existing Dataflex applications, the vendor said.

Development licenses for Dataflex Revision 3.0 start at $1,250 for a four-user Novell, Inc. or OS/2 network.

Data Access
14000 S.W. 119th Ave.
Miami, Fla. 33186
305-238-0012

Training

Perfect Mentor, Inc. has announced a computer training system designed for law firms and businesses that teach personal computer skills or Wordperfect 5.0.

Perfect Mentor *teaches PC skills for law firms and businesses*

Using the Perfect Mentor system, trainers can choose from four main elements: an interactive computer-based training simulation program (Perfect Mentor Module I), nine manuals for classroom training or personal reference, more than 100 documents on disks for use with Wordperfect and a Personal Progress Tracker for designing custom training tracks, the vendor said.

A stand-alone version of Perfect Mentor Module I is being offered with a $20 discount for $637; a multiuser network version licensed for two users costs $737. Elements of the training package can also be purchased separately.

Perfect Mentor
5433 S.W. Vacuna
Portland, Ore. 97219
800-445-6300

A training technique for Wordperfect Corp.'s Wordperfect 5.1 is being offered by Microvideo Learning Systems.

The Wordperfect 5.1 Learning System features a videocassette, a data diskette and an in-depth manual. Topics covered include pull-down menus and the mouse, new formatting options, working with tables, new merge features, merge and macro commands and the equation editor. The video is 120 minutes long, and recommended training time is four hours, according to the vendor.

The product may be purchased separately for $495 or with the Wordperfect 5.0 Learning System for $1,195.

Microvideo
Suite 600
91 Fifth Ave.
New York, N.Y. 10003
212-255-3108

Peripherals

Extended Systems, Inc. has introduced a sharing device that resides in the optional I/O slot of a Hewlett-Packard Co. Laserjet III printer.

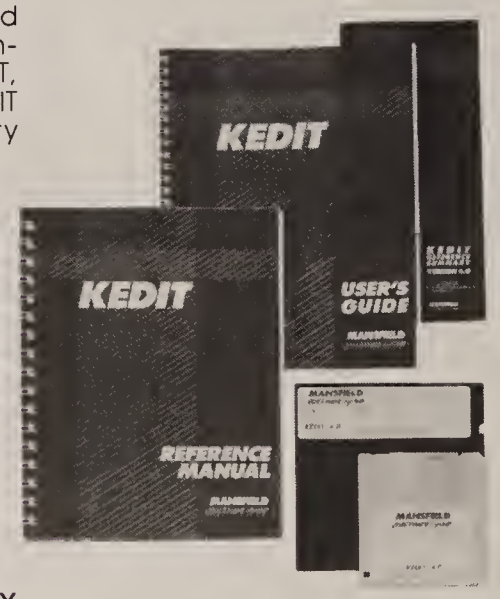
The ESI-2094A can accept data simultaneously from four connected devices and supports parallel transfer rates of more than 30K bit/sec. on all input ports, according to the vendor. The product also offers a 1M-byte standard memory buffer.

The price for the ESI-2094A is $845.

Extended Systems
6062 Morris Hill Lane
Boise, Idaho 83704
208-322-7163

KEDIT 4.0
XEDIT COMPATIBLE PC EDITOR

KEDIT™ is a text editor for DOS and OS/2 that supports most commands and features of XEDIT, IBM's editor for VM/CMS. But KEDIT goes beyond XEDIT compatibility with special PC-based features for a first-rate combination of mainframe power and PC flexibility.



- **More than 100** XEDIT compatible commands and SET options, including the ALL command.
- **XEDIT prefix commands,** targets, and fullscreen layout.
- **Multiple files, multiple windows.**
- **Built-in subset of the REXX** macro language included.
- **Interfaces to Personal REXX,** our complete implementation of REXX.
- **Enhanced block operations.**
- And much, much more.

"While KEDIT remains true to its heritage in retaining compatibility with the mainframe XEDIT, it is also one of the most feature-packed PC text editors around."
PC Magazine, 10/31/88

MANSFIELD *Software Group*
P.O. Box 532, Storrs CT 06268
(203) 429-8402

DOS Version: $150
OS/2 Version: $175
(includes DOS version)
Shipping: $3
Demo version available.

KEDIT is a trademark of the Mansfield Software Group, Inc

DATA STREAM

Thomas L. Nolle

SAA open and closed

Almost lost in the fanfare of its RISC System/6000 debut was the fact that IBM has made some sweeping commitments in the communications area. IBM has opened up both of its AIX systems and the low end of its Systems Application Architecture (SAA) proprietary system base to connections with other vendors' systems via popular industry protocols.

The products that will be affected most by these changes are the "populist" IBM systems — OS/2 and OS/400. What IBM is promising here is to provide all of the internetworking options that have been denied at the low end. The effects of this will be to make IBM's SAA products for the office more open to non-SAA connections and, in particular, to facilitate Unix networking with IBM's low-end "commercial" lines.

In the area of file sharing, OS/400 and OS/2 both provide server capabilities for personal computer products attached through Token-Ring networks. The new announcement commits to extending that support in two ways.

First, the Applications

Continued on page 68

T1 supercomputer net reaches across Atlantic

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The nation's data network for supercomputer-based research projects has implemented a T1 link between the U.S. and Europe and demonstrated a prototype T3 network that is expected to be operational at the speed of 45M bit/sec. later this year.

Such increases in transmission speed could make it easier for U.S. scientists to collaborate with overseas colleagues, according to the partnership that runs the National Science Foundation Network (NSFnet).

The T1 trans-Atlantic link, provided by IBM and MCI Communications Corp., runs from the supercomputer facility at Cornell University in Ithaca, N.Y., through the TAT-8 undersea fiber-optic cable to Geneva, where it connects with a European supercomputer network much like the NSFnet in the U.S.

Compared with the existing satellite links, which transmit at speeds of 56K to 64K bit/sec., the high-speed private T1 line will make scientific collaboration more effective because researchers can see the same graphic images and text almost simultaneously, officials said.

IBM, MCI and Merit Computer Network, which manages NSFnet from its base in Ann Arbor, Mich., demonstrated the T3 capability over MCI circuits during the National Net '90 conference in Washington, D.C., earlier this month [CW, March 12].

System 6000 used

IBM used several of its recently announced RISC System/6000 workstations, equipped with prototype network adapters and specially designed packet-switching software, to connect conference participants with the NSFnet operations center in Ann Arbor.

IBM also demonstrated the ability to connect two RS/6000s on a Fiber Distributed Data Interchange local-area network, operating at 100M bit/sec.

"With a T3 network, we can improve our scientific productivity in ways that are currently impossible," said Stephen S. Wolff, a division director at the NSF.

"New applications will enable scientists to steer large computations on remote supercomputers and visualize the progress of these simulations across the network in real time," added Michael M. Connors, director of computing systems at IBM Research. "A national T3 data network would improve the access to large and expensive shared scientific resources like telescopes, nuclear particle accelerators, wind tunnels and supercomputers."

The U.S. portion of NSFnet is currently at T1 speed and is expected to be operating at T3 later this year.

LANs on the way to better, not bigger

Study shows emphasis on efficiency in current systems is on the rise

BY JIM NASH
CW STAFF

Information systems departments are ready to begin filling out and bridging their installed local-area networks rather than furiously building new ones, according to a recent report by the investment firm Salomon Brothers, Inc. in New York.

The report, written by analyst Michel Guite, charts a dramatic plateau in personal computer LAN and LAN component sales growth. Guite anticipates a radical flattening in most market categories and predicts sales declines in two segments — adapter cards and proprietary servers.

Guite examined market figures from 1987 through 1991 for 3Com Corp.; Novell, Inc.; Cabletron Systems, Inc.; Synoptics Communications, Inc.; Microcom, Inc.; and Vitalink Communications, Inc. He combined these totals with industrywide LAN numbers to spot trends in PC and system LAN markets.

More PC growth

Guite predicted a steady increase in the percentage of PCs and workstations being connected to PC LANs, up from 24% last year to 29% this year and 33% in 1991.

Report figures indicated that new purchases overall will fall, with the strongest sectors including bridges, routers and the nuts-and-bolts cable and cable components. At the same time, he said, sales growth in operating system software, proprietary servers, LAN adapter cards and LAN components will level off or drop the soonest.

Leading the decline in sales growth, Guite predicted, will be proprietary servers and PC LAN adapter cards. Guite said proprietary server sales will increase only 4.5% to $943 million this year and will drop 10.8% in 1991 to $841 million.

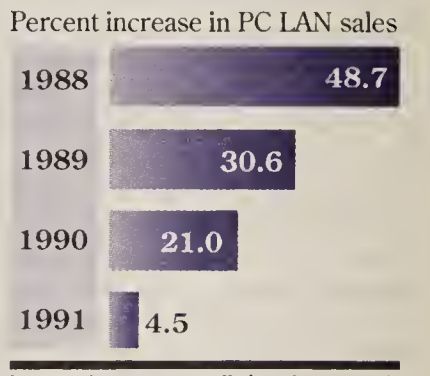
However, the overall server market, which includes standards based PCs, workstations and minicomputers, will grow at a compound rate of 54.4% per year from 1987 to 1991, the report said.

Sales of adapter cards rose 61% from $809 million to $1.3 billion between 1987 and 1988, Guite said. Growth was halved last year to 29%. Guite projected growth slowing further to an an-

Continued on page 69

Brake time

The days of almost 50% annual growth are in the past for the PC local-area network market



Source: Salomon Brothers, Inc.
CW Chart: Doreen Dahle

IBM begins to fill open systems gaps

BY ELISABETH HORWITT
CW STAFF

RYE, N.Y. — Conceding that "situations will exist where SAA systems and AIX systems need to be interconnected," IBM recently filled in some gaps in its strategy of supporting industry and de facto standards as a means of connecting its own systems and those of other vendors, and managing the result.

When IBM announced its RISC System/6000 family of systems last month, the firm also stated its intent to provide support for Systems Network Architecture LU6.2, Open Systems Interconnect (OSI) and Transmission Control Protocol/Internet Protocol (TCP/IP) across all AIX systems, as well as for the Systems Application Architecture (SAA) environments — VM, MVS, OS/2 and OS/400.

Piece by piece

IBM's interoperability strategy is gradually coming together

	AIX/6000	AIX/PS/2	AIX/370	MVS	VM	OS/2 EE	OS/400
SNA LU6.2	AN	SOD	*	AV	AV	AV	AV
OSI	SOD	SOD	SOD	AN	AN	SAA	SAA
TCP/IP	AN	AV	AV	AV	AV	AN	AV
SNMP	AN	SOD	SOD	SOD	SOD	AN	SOD
CMIS/CMIP	SOD	SOD	SOD	AN	AN	SOD	SOD

AV = Available
AN = Announced
SOD = Statement of direction (current or future version)
SAA = Statement of support previously introduced by SAA

* For the System/370 AIX environments, direction for selected future AIX version product offerings will be announced at a later date.

Source: IBM
CW Chart: John York

Among the key pieces that IBM added to its existing communications strategy included the following:

- Support of LU6.2 on the AIX/6000, with a direction statement to support other AIX systems. Until now, IBM had provided no AIX support for the peer-to-peer protocol, which forms the fulcrum of the vendor's networking strategy.
- Intent to provide OSI support for AIX, as well as for OS/2 Extended and OS/400 systems. Previously, IBM had announced OSI support only for MVS and VM systems.

A ground-breaking IBM announcement in the network management area was AIX/6000 support for the Simple Network Management Protocol (SNMP), a de facto network management standard typically used to manage TCP/IP networks. A prototype of this system is currently being used by the National Science Foundation to manage NSFnet, a high-speed backbone that connects research and academic institutions in the U.S. and, increasingly, abroad.

In addition, IBM announced SNMP support for OS/2 and made a statement of direction to support the network management protocol on other AIX systems, as well as on all SAA systems.

However, these are implementations of the SNMP "agent," which turns a system into a management halfway point that passes data up to, and commands down from, a "supermanager," which in this case would be IBM's Netview.

In contrast, IBM's AIX/6000 implementation of SNMP includes both the agent and the monitor portion of the protocol,

Continued on page 68

Nolle

CONTINUED FROM PAGE 67

System/400 will support the Sun Microsystems Network File System (NFS), the most popular Unix resource sharing environment, in server mode. This will enable any Unix system linked via the AS/400's Transmission Control Protocol/Internet Protocol (TCP/IP) Ethernet local-area network support to access AS/400 disks and printers.

Second, IBM will provide NFS client support to OS/2, allowing it to share files on Unix NFS servers. TCP/IP support has already been announced.

In standards-based communications, IBM has promised to provide Open Systems Interconnect (OSI) protocol support on both the OS/2 and OS/400 environments. This would involve the same OSI "stack" implemented on MVS and VM and would provide low-end users with facilities for standards-based electronic mail, file transfer and even distributed application development.

IBM has also stated that it will provide support for the Unix-standard X Window System client/server graphical environment, offering AS/400 users client access to X Window applications and OS/2 users both client access and the ability to run X Window applications.

By implementing NFS and OSI on its lower end systems, IBM has cut them loose from the data center by allowing them to communicate directly with non-IBM systems. Formerly, such communication was possible only through an IBM host. This means users no longer have to make an irrevocable strategic choice between Unix and OS/2 or AS/400.

Unfortunately, there is a closed side as well. Not only has IBM left out some features and demonstrated that it is not yet ready for fully open networking across all systems, it also has not implemented NFS client software or X Window server software on the AS/400. AS/400 users cannot, under present commitments, hope to share files on a Unix server or run X Window applications. Either of these might open the AS/400 too much to Unix competition, even from IBM's own RS/6000.

But the biggest disappointment is in the area of network management. IBM has promised support for the critical OSI management standard, Common Management Information Protocol (CMIP), and TCP/IP's Simplified Network Management Protocol (SNMP) on all of its SAA and AIX systems.

The bad news is that OS/2 and OS/400 will only support the agent side of CMIP and SNMP. This means they will be manageable by host systems running those protocols but will not be able to act as the management focal point for other OSI- or SNMP-compatible systems. Netview will be, then as now, the recognized manager of IBM's networks.

The decision to close ranks around Netview contradicts IBM's other moves toward openness and shows that IBM does not fully understand users' network management needs. By preventing the AS/400 from becoming an OSI network management center, IBM is encouraging users to go to another vendor if they want to manage their networks on something less costly than an IBM mainframe.

Nolle is president of CIMI Corp., a communications consulting company based in Haddonfield, N.J.

IBM

CONTINUED FROM PAGE 67

which allows an AIX workstation to act as a network management system on its own. IBM has made a statement of direction to provide the system with a linkup to Netview so that it "will be able to forward SNMP traffic to Netview or act as a local manager," IBM TCP/IP product manager Gail Meyer said.

IBM also made a statement of direction to support the Common Management Information Protocol and Common Management Information Service across all of its AIX and SAA systems. Right now, only IBM MVS and VM hosts support the OSI protocols.

Again, however, IBM is implementing only the agent side of the management standard, turning its various systems into entry points which, along with Netview/PC, act as liaisons between various networks and Netview. "IBM's strategy for handling multivendor network management is Netview," providing the network manager with "one tool to manage the network, whether it is OSI or TCP/IP," an IBM spokesman said. IBM has set up the AIX system as a stand-alone network manager because it realized that some "just plain Unix" sites operate "where IBM backbone hosts are not available," IBM spokesman Michael McClennan said.

A GROUND-BREAKING IBM announcement in the network management area was AIX/6000 support for the Simple Network Management Protocol.

Users may eventually see a stand-alone Common Management Information Protocol implementation on AIX, since IBM sees "the need to migrate from SNMP to an OSI [network management workstation] in the future," Meyer said.

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ACC taking the Decnet route

BY JOANIE M. WEXLER
CW STAFF

Advanced Computer Communications (ACC) plans to announce tomorrow that its bridges and routers now support Decnet Phase IV routing.

Decnet Phase IV is Digital Equipment Corp.'s proprietary seven-layer communications protocol stack, which DEC is transitioning to support Open Systems Interconnect (OSI) protocols at the bottom four layers. Decnet's routing protocol was recently chosen as the basis for the OSI routing standard.

ACC said last week that it is adding the Decnet support to existing Internet Protocol routing through software enhancements to its $7,500 ACS 4100 standard hardware and $8,500 to $20,500 ACS 4400 multiport platform. Both platforms can function as a bridge, router or a combined bridge/router.

All ACC bridging products have management features based on the open Simple Network Management Protocol for managing heterogeneous devices.

ACC said it is solely targeting value-added resellers and systems integrators with its bridging products, because it sees a niche in providing that market with new opportunities to service its account base.

Tariff 12 ball keeps on rolling

BY ELISABETH HORWITT
CW STAFF

AT&T's Tariff 12 juggernaut showed a fresh burst of speed last week, with three more major companies signing multiyear, multimillion-dollar contracts with the communications giant.

As part of its strategy to move away from a privately managed dedicated network, Atlantic Richfield Co. (Arco) signed a five-year contract under which AT&T will provide switched voice and data services as well as design and possibly operate a network management center for the petroleum products company.

Still under discussion is whether AT&T, Arco or both companies would operate the center, an AT&T spokeswoman said. However, AT&T would retain ultimate management responsibility for its own switched network facilities, she added.

Also last week, CSX Technology Group signed a three-year, $30 million contract under which AT&T will provide voice and data connections among 500 sites at parent CSX Corp., an international transportation company.

General Dynamics Corp. signed a contract valued at more than $18 million over a five-year period, including two one-year renewal options. Under the contract, AT&T will set up a network to provide integrated voice, data and video to the giant defense contractor's corporate headquarters in Clayton, Mo., and 300 other locations.

LANs

CONTINUED FROM PAGE 67

ticipated 20% ($2 billion) this year before dropping 6% in 1991 to $1.9 billion.

One of the more hearty market segments was what Guite called physical-layer PC LAN sales. Included under this heading are repeaters, concentrators and wiring assemblies. However, even here sales growth is expected to fall drastically.

Guite stated that sales grew 125% between 1987 and 1988 from $223 million to $502 million. The growth rate is expected to continue halving annually, reaching 17% next year, with sales totaling $1.3 billion.

Guite predicted that operating system software sales growth rates will decline steadily from 58% in 1988 to an estimated 17% in 1991, when sales will reach $1.4 billion. Much of the stability here can be attributed to increased connectivity to Unix-based systems, he explained.

PC LAN bridge and router sales growth should fall less sharply as well. The report indicates that growth will slow from 59% in 1988 to 21% in 1991, when sales are expected to reach $500 million.

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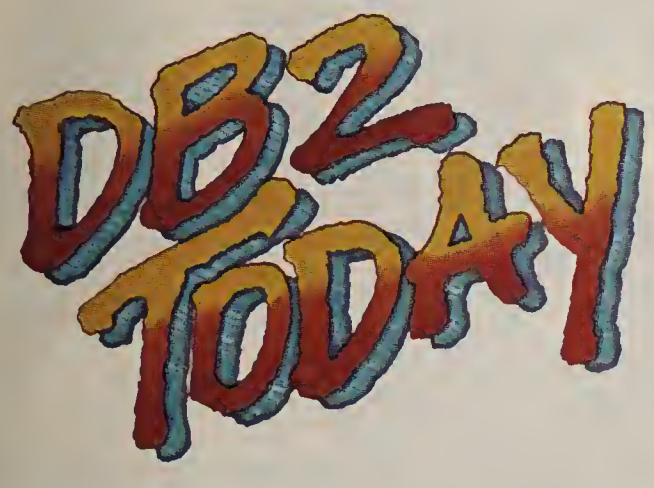

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San Francisco, Ca.	Aug. 1, 2	Chicago, Il.	Oct. 23, 24

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A study in systems transparency

UMass' Project Pilgrim sets sail in heterogeneous computing environment

BY JIM NASH
CW STAFF

AMHERST, Mass. — Using a number of separate software technologies, systems managers at the University of Massachusetts are building transparency into the campus' highly heterogeneous computer community.

UMass plans to wrap universal time, remote procedure call (RPC), authentification and naming services into one coherent bundle and apply the package in an undertaking called Project Pilgrim. Only the university's Computer and Information Science Department and the College of Engineering will take part in the project. Between the two, there are 4,300 users.

Information systems managers intend to eliminate the need for users in heterogeneous environments to know every operating system's setup and commands in order to use those systems, said Art Gaylord, director of computing facilities for the university's Computer and Information Science Department. Simultaneously, managers will address the task of managing such a sprawling system.

UMass will use a $6 million, three-year grant from Digital Equipment Corp. to fund the project. As part of the grant, DEC will supply equipment, personnel and expertise for Pilgrim.

In return, DEC will receive nonexclusive, nonroyalty rights to use any software born of Pilgrim, according to Kathleen Rubin, co-director of UMass' engineering computer services. Other vendors, such as Sun Microsystems, Inc., IBM and Texas Instruments, Inc. have expressed interest in the project, but none have enlisted to date.

Pilgrim will use much of what was learned through Project Athena, a joint connectivity project among MIT, IBM and DEC that was launched in the early 1980s. DEC collaborated with IBM and MIT throughout the 1980s to think through emerging connectivity problems. One of the chief products of Project Athena was connectivity software, including X Window System.

However, whereas Athena resulted in connectivity software for IBM and DEC equipment, Pilgrim seeks practical ways to connect minicomputers and workstations from vendors such as DEC, Sun and TI, as well as various brands of personal computers, UMass officials said.

There are other joint industry/university projects looking for connectivity answers, but Pilgrim stands out because of its emphasis on heterogeneity.

Edward Cohen/Business West

UMass' *Paul McOwen (left), Kathleen Rubin and Art Gaylord*

"We have 4,000 users [in the College of Engineering]," explained Dan Blanchard, co-director (with Rubin) of engineering computer services. "We have to manage user accounts on each and every one of those 4,000 users in the absence of a project like this."

There is some degree of connectivity on campus now, most of it through Ethernet running several protocols, including Decnet and Transmission Control Protocol/Internet Protocol, Gaylord said. "But users still have to know specifically what to do [to access and operate a different system] when they get there," Gaylord said. "We're trying to hide the differences between operating systems and hardware for the user."

For Blanchard, Pilgrim's goal is clear: "We want more of a traditional central-management approach to a distributed system. [UMass needs] a standard platform on which to develop educational courseware for instruction, student interaction and teachers' planning."

Gaylord said that RPC service is critical to workstation users, who would benefit from the increased speed and horsepower attained through RPC. RPC enables users to run a program on the fastest resource available at a given time without having to rewrite the program if the fastest resource runs on a different operating system.

The service also enables users to break massive programs into pieces, distributing them to a number of available workstations for faster processing.

Charles Wilson, DEC's senior program manager for Pilgrim, said, "Security is of the utmost priority" for Pilgrim. Authentification becomes more of a problem in distributed systems environments — for the system and the user. Not only does the system need to accurately identify authorized users, but users also increasingly need to know where their programs are going — knowledge that is not commonly available, Wilson said.

NEW PRODUCTS

Cabling

Bravo Communications, Inc. has introduced its Sure/Fire Port Protector series, designed to protect computer equipment from all forms of data-line transients.

The parallel port protectors are available in either 25- or 36-pin configurations and include shielded connectors for additional protection and proper grounding.

Pricing ranges from $59 to $69, and all units come with a standard one-year warranty.

Bravo Communications
Suite 107
1310 Tully Road
San Jose, Calif. 95122
408-297-8700

Links

A shared very small aperture terminal (VSAT) network has been introduced by Racal-Milgo Skynetworks.

The service is based on the sharing of regional hubs in a geographic region of 50 to 100 miles in radius. In each region, Racal-Milgo Skynetworks forms a partnership with a company or organization that acts as a host for the hub.

The service includes installation, operation and maintenance of the hub and all associated VSATs, acquisition of satellite space segments and full, 24-hour network management.

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201 S. College St.
Charlotte, N.C. 28244
704-377-2232

Uniview, *Integrated Telecom's net management tool*

Network management

Integrated Telecom Corp. has announced Uniview, a network management tool for point-to-point or large network operations.

The system comprises an Intel Corp. 80386-based IBM Personal Computer 80386 that runs under OS/2 with 8M bytes of random-access memory, a 1.2M-byte floppy disk drive, an 80M-byte hard disk drive, an integral processor card, an NEC Multisync four-dimensional color CRT and a dot-matrix printer.

With Uniview, network managers can provision, administer, maintain and control any node in a network by using a color graphics-based, mouse-driven interface, the vendor said.

The tool is slated to begin shipping in September. The price of the PC hardware is $15,000; Uniview 1.0 application software is $5,000. Delivery is sheduled to be 90 days after receipt of order.

Integrated Telecom
630 International Pkwy.
Richardson, Texas 75081
214-234-3340

Network services

Western Union Corp. has introduced a service that provides customers with business news or information on user-selected topics via facsimile or electronic mail.

With the Executive Briefing Service, customers can obtain data on products, industries, companies or technical terms without the need for a host computer, the company said. For a single subscription, the service can monitor a range of information sources, such as news wires, press releases, trade journals, newsletters, government reports and patent documents. The service can also provide English translations of foreign materials.

The service's price is a flat rate of $595 per month.

Western Union News Bureau
One Lake St.
Upper Saddle River, N.J. 07458
(201) 818-5000

Modems

Raycom Systems, Inc. has announced the 5080 I/O module, which is designed for use on its Fiberring 100 fiber-optic campus backbone system.

The product enables users to multiplex up to 896 IBM 5080 workstations over a 100M bit/sec. fiber-optic ring. When used with an IBM 5088 Model 2 Graphics Channel Controller, a pair of 5080 I/O modules can accommodate two controllers, 64 IBM 5085 Graphics Processors and 5080 workstations, according to the vendor. The modules are transparent to 5080 protocols and operate at the local data rate of 1M or 2M bit/sec., with automatic speed selection.

When the module is used in the FR100 fiber-optic multiplexer, the transmission distance between the controller and the workstations extends beyond that of copper cable.

Single-unit quantities of the 5080 I/O module cost $1,850; delivery is 60 days after receipt of order.

Raycom Systems
6395 Gunpark Drive
Boulder, Colo. 80301
303-530-1620

Universal Data Systems has combined a 19.2K bit/sec. leased-line modem with a two-channel time division multiplexer (TDM). The UDS 1922's integral TDM allows two data terminals to communicate over a single leased telephone line.

The UDS 1922 is designed for synchronous data transmission and reportedly communicates in full-duplex mode over four-wire lines at 19.2K, 16.8K, 14.4K and 12K bit/sec. A selectable V.33 mode allows the modem to connect to other vendors' modems at 14.4K bit/sec.

The modem automatically adjusts its data rate depending on telephone line conditions. It features trellis-coded modulation, automatic adaptive line equalization and line-quality adjustment.

The UDS 1922 is priced at $2,995.

UDS
5000 Bradford Drive
Huntsville, Ala. 35807
205-721-8000

EXECUTIVE TRACK

Thomas E. Allen has been promoted to director of technology at **Alexander & Alexander, Inc.** (A&A), an insurance brokerage and risk management consulting firm in Owings Mills, Md.

Allen will coordinate technical activities in the company's domestic information services operations. He joined A&A in 1988 as technical manager of A&A's Business Automation unit. Before that, he was a vice-president of systems development at Citicorp.

Allen holds a bachelor's degree from the State University of New York and a master's degree in operations research from New York University.

Michael Biagioli has been named vice-president and director of information services at **Young America Corp.**, a promotion fulfillment and telemarketing company in Young America, Minn.

Biagioli was formerly a senior staff manager at Comp-U-Staff in Minneapolis. His previous positions include project manager and financial systems manager at Jostens, Inc. in Minneapolis, project leader at Allis-Chalmers Credit Corp. in Milwaukee and systems analyst at Harnischfeger Corp. in Milwaukee.

Biagioli holds a bachelor's degree in business administration from the University of Wisconsin at Milwaukee. He is a member of the Data Processing Management Association.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Experiencing life at the top

Merrill Lynch's Peterson earned his way into top management's inner sanctum

BY AMY CORTESE
CW STAFF

PROFILE: DuWayne Peterson

Andy Freeberg

Position: *Executive Vice-President, Operations/Systems and Telecommunications, Merrill Lynch & Co.*

Mission: *To control IS costs in an industry downturn while continuing to deploy technology to strategic advantage.*

Tracking Merrill Lynch & Co.'s minute-to-minute stock performance on a personal computer in his corner office overlooking Manhattan's financial district, DuWayne Peterson does not look like your average information systems chief. Indeed, he is not.

Known as the million-dollar man because of his seven-figure salary [CW, Jan. 15], Peterson has accomplished what many IS executives are still striving for — entry into the inner circle of top management.

"You couldn't be in a better position" in this industry, acknowledges the 58-year-old Peterson. But he stresses that his job goes beyond that of the typical IS chief.

As executive vice-president, operations/systems and telecommunications at the nation's largest retail brokerage house, Peterson oversees 12,000 employees and a budget of just over $1 billion.

As testament to his important role at Merrill, he is an *ex officio* member of the Executive Committee, along with the chairman, president and a handful of other executive vice-presidents.

Peterson seems to have the right balance of technical and business savvy, colleagues say.

"DuWayne is very much a senior business executive, at the top of the organization. With a firm like Merrill Lynch, that's what you need," says Bruce Turkstra, Merrill's senior vice-president of global IS.

"He has good political sense and social sense," adds Gerry Eli, director of global IS. "He fits right in with upper management."

Peterson cites three success factors for aspiring IS executives: a solid track record of performance, good communication skills and the ability to translate technology into business terms. "The key is establishing credibility with management," he says. "The compliment I always get is that I make it sound so easy. You have to take the mystery out of it."

An only child born in Evanston, Ill., Peterson spent most of his youth in the

Continued on page 80

The IS task ahead: Nobody thinks it'll be easy

BY ALAN J. RYAN
CW STAFF

Ouch!

Information systems managers say they will be feeling "high" to "excruciating" levels of pain as their companies transform the way they use information and ultimately do business in the next decade.

In a recent poll of 112 senior executives surveyed by Arthur D. Little, Inc. at its "Implementing the Information-Based Organization" conference (see story on page 77), two-thirds said the transformation process will be painful.

However, what was most interesting in the findings, according to Arthur D. Little senior consultant Laurence Chait, is how rapidly the companies said they will have to change.

For example, 96% of those polled said their companies were either traditionally based or semi-traditionally based in 1980 — meaning the management was hierarchical and structured, and strict rules were followed regarding access to information. Today, that number still stands at a hefty 94%.

By the year 2000, however, just 4% of the executives said their companies will still follow that management format. The other 96% said they believe their companies will be information-based by 2000 — meaning that they will be flatter and more responsive and that the employees will be empowered to do whatever needs to be done to help the company.

Arthur D Little

"That is a major change in the way companies are structured, organized and do work," Chait said. Most of the executives said it is critical or inevitable that their companies become information-based, he added.

Of those polled, another 96% said that once their organizations become information-based, their organizations will be better places to work. "Ultimately," Chait said, "the transformation will completely alter the way they do business."

Nearly 60% of the respondents said customer focus, and 46% said total quality management, were key driving forces that mandate the shift to the information-based organization.

Chait said it is important to realize that, while technology will be the enabler of the changes on the way in corporate America, changes in values and reward structures will also drive the move toward the information-based organization.

Approximately 90% of the companies represented in the poll had annual sales in excess of $100 million, Chait said. Smaller companies tend to be more entrepreneurial, which tends to make them more information-based, he said.

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BOOK REVIEW

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By Allan R. Cohen and David L. Bradford
John Wiley & Sons, $19.95

When I first looked at the title of *Influence without Authority*, I thought, "Oh no, a book about brownnosing." Well, not exactly. The book is a realistic and engaging look at how to get things done when you don't necessarily have the authority to just say "Do it." It makes its points by using two increasingly rare commodities: practicality and common sense.

Written by Allan Cohen and David Bradford, the co-authors of the bestseller *Managing for Excellence,* the book is a response to the needs of today's firms. In these days of intense competition and lightning-fast technological change, companies have to be fast on their feet just to introduce a product before it is outdated.

In order to respond to today's business environment, the authors say, decisions and cooperation must increase on a horizontal level. It doesn't make sense anymore to keep the power concentrated with a few top people. The current flattened organizational structure of many companies forces employees nowadays to take the initiative in getting things done. This creates a greater need for clear communication and the ability to creatively influence people.

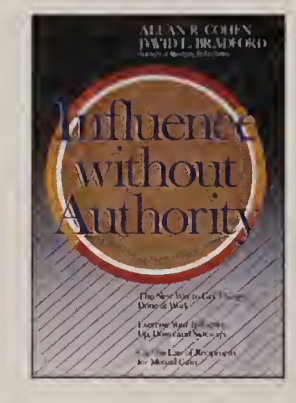
This method is hardly ground-breaking. Digital Equipment Corp., for example, has had a similar structure in place for years. The value of *Influence without Authority* lies in its ability to take you through the process in a step-by-step fashion and show you the ropes. The authors' approach takes commonsense principles such as "walk a mile in my shoes" or the famous "do unto others . . ." and translates them into a business guide to influence.

You scratch my back . . .

The authors base their approach on the theory that the exchange of favors between people is the base of most successful influence. Dealing with people involves the "law of reciprocity," or the general feeling that one good turn deserves another. For example, if your boss asks you to work several weekends in a row, you would expect some form of acknowledgment. This could take the form of anything from a heartfelt "thank you" to some extra time off, but the extra effort needs to somehow be paid off.

These forms of exchange are divided into three different categories: tangible goods, such as equipment; tangible services, such as faster response or public support; and sentiments, which would take the form of appreciation or praise. These can all be used for successful influencing, and they lie at the root of nearly everything that gets done in business.

Cohen and Bradford discuss many different "currencies of exchange" with which the would-be influencer can bargain and finding the one in which your potential ally trades is vital to your attempt at influencing. For example, if you need a favor from a product manager whose first priority is the financial bottom line, he is not likely to be impressed or swayed with figures about time savings. The request should be couched in terms of potential cost savings, if possible.



None of this stuff is earth-shattering. A lot of it is good common sense. But that shouldn't alter the fact that getting to know the practical use and application of these ideas could make your work life both more pleasant and more effective. The authors outline possible exchange strategies, from influencing your boss to playing hardball as a last resort. They present situations in which influence strategies are attempted — not always successfully — and then analyze what happened.

There is a thin line between influencing and manipulation, and there are those who question the ethicality of these methods. The authors emphasize that getting things done through exaggeration and lies will result in short-term benefits only. Since acceptable currencies of exchange can range from getting a report done early to reinforcing somebody's pride in a job well done, it is important to keep the record honest. As the authors comment in their discussion of manipulation, "To make exchanges work, you must build a track record of trust. The whole system breaks down when it becomes an endless hand of liars' poker."

Cohen and Bradford are meticulous about making their points clear — sometimes a bit too much so. A particular issue can be summarized as many as three times in one chapter, and if it crops up later on in the book they'll summarize it again, in case you forgot. Other than that small problem, *Influence without Authority* will find you nodding your head in agreement as they hit home with one practical piece of advice after another.

CAROL HILDEBRAND

Hildebrand is a *Computerworld* features copy editor.

Is your computer company giving you the right equipment for the job? Bell Atlantic Computer Products has all the alternatives.

Internal data flow seen as crucial to info-based firms

BY JEAN S. BOZMAN
CW STAFF

PALM SPRINGS, Calif. — The "information" in the information-based organization of the 1990s no longer translates into the word "data." While traditional information systems organizations are used to manipulating data, the challenge of adding value to it — making it into information that can be used competitively — eludes many.

Speakers at a recent Arthur D. Little, Inc. management conference concluded that the organization that runs on well-timed "information" does, indeed, have a competitive edge. However, most organizations still struggle with freeing themselves from hierarchical reporting structures that often filter or distort data as it travels through an organization.

"In the information-based organization, information is a two-way street," said management consultant Peter Drucker, who coined the term "information-based organization" in a now-famous 1988 *Harvard Business Review* article. "People will have to take responsibility for finding out what information they will need [to do their job] and for finding out what information they owe [to others in the organization]."

Speaking to the IS executives present, Drucker said: "You have a training job to do. You have created a small core of [information] specialists in your department, but you will have to train other people in your organization to become information-literate. That's because IS is one of the very few places [in a corporation] where you can see the whole business."

Mutual Benefit Life Insurance Co. in Newark, N.J., has been working just as hard on spreading information as it has worked on flattening its organization in recent years, according to Mutual Senior Vice-President Keith T. Glover. To reduce the number of individual clerks and agents involved in issuing a life insurance policy, the company made centralized databases widely available through IBM Personal System/2 interfaces.

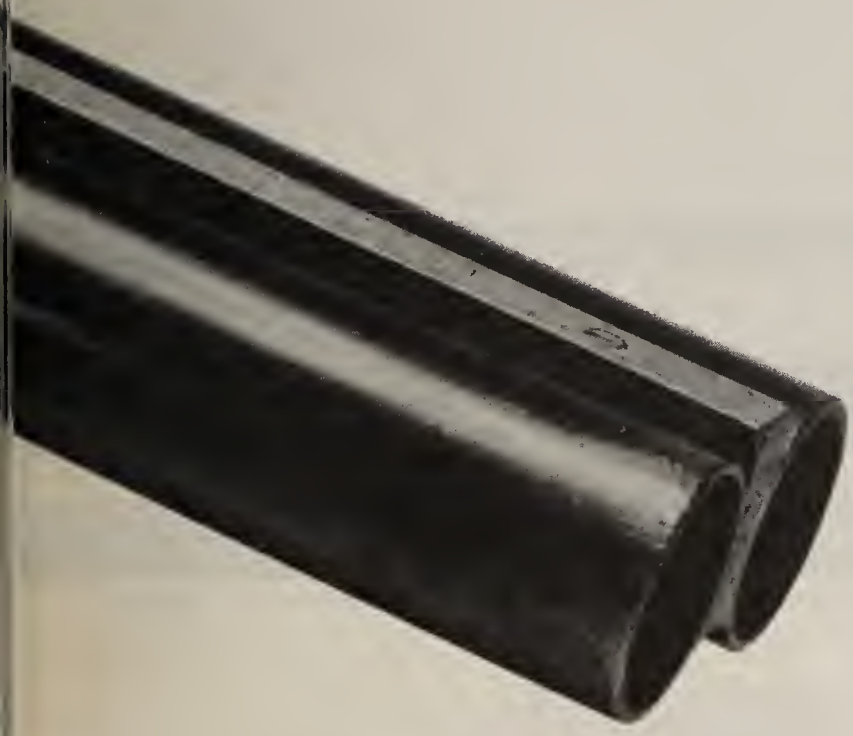
"We were a classic monolith in 1984," Glover said. "But we were determined to make our business more entrepreneurial and transaction-oriented. We set up the database to support one-stop shopping instead of passing the policy around to many people who owned a piece of the data."

In the process, Mutual cut 75 positions in the field and 100 more at headquarters. Response to customer inquiries was reduced from several weeks of paper shuffling to either several days for a mailed inquiry or one phone call.

Communications is a key to the information-based organization, speakers agreed. Sunkist Growers, Inc., the California citrus fruit cooperative, found that its system of communicating pricing and inventory information among 60 packing houses was hampering its ability to sell to supermarkets nationwide. To combat the problem, the association of 6,000 growers is building a new data infrastructure, said Bud Flach, vice-president of finance and administration.

Even if they are widely available, the contents of a corporation's database have to be reshaped to yield a competitive edge. Roadway Package Systems, Inc. in Pittsburgh uses the river of information flowing through its 15 regional sorting centers to produce additional customer services, said Bram Johnson, the firm's vice-president of marketing. The basic data is presented in different ways to give customers and Roadway employees "views" of the business, Johnson said.

"We really believe we differentiate our product with information," Johnson said. "My trucks don't go any faster than my competitors' trucks do, but I can give my customer information on demand about where his package is."



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Software for political advantage

BY CLINTON WILDER
CW STAFF

OAKLAND, Calif. — The Environmental Defense Fund (EDF) is not in the computer business. Among California utilities, however, its software has become the kind of industry standard that companies like IBM and AT&T dream about.

An energy-use forecasting program called Elfin, developed by EDF economic analyst Dan Kirshner, is now the required model for California utilities applying to state energy regulators for rate adjustments or new construction. One utility, Southern California Edison, is currently using the EDF model for four different regulatory filings, including its proposed merger with San Diego Gas & Electric.

The story of Elfin is a tale of technology for competitive advantage — but on public issues, rather than in the marketplace. It is also the story of how EDF, a New York-based nonprofit environmental advocacy group, became a software vendor of sorts.

Developed by Kirshner in the late 1970s as part of EDF's effort to fight nuclear and coal plant construction, Elfin has helped revolutionize energy planning in California.

"It has served to eliminate the mystique of the modeling alchemist," says Lon House, chief resource planner at the California Public Utilities Commission (PUC) in Sacramento. "Before this common model standard, only the power companies and the PUC really knew what was going on. Now anyone with a PC can afford Elfin and can do their own filing using their own assumptions."

In the late 1970s, Pacific Gas & Electric mounted an ambitious campaign to spend several billion dollars building nuclear and coal-fired power plants in the 1980s. While many opposed the plans on safety and pollution points, EDF's arguments were economic. EDF specifically objected to assumptions about future energy use that PG&E had made based on its mainframe forecasting models.

EDF hired Kirshner, then 22, an economist by training but a computer techie by proclivity, to help it challenge those models with a new one. The more flexible EDF model allowed calculations using different types of assumptions, most importantly future energy-saving measures such as conservation and cogeneration.

"There's only so far you can get by just questioning," Kirshner says. "At some point, we had to come forward with an alternative. We needed to analyze what the utilities were doing on their own terms."

Robert Holmgren

EDF's Kirshner *developed energy forecasting software that is now standard in California*

Kirshner developed the first version of Elfin, in Fortran, on a Control Data Corp. 6400 at the nearby Berkeley campus of the University of California. He later wrote a Unix-based front end; Elfin is now available in micro and mainframe versions.

Although Elfin originally helped EDF win a victory for environmentalists, it is now used by the utilities themselves as a business planning tool.

"It's very cheap, easy to learn and runs long-term planning forecasts much more quickly than the CPU-hungry models," says Luis Pando, a planning engineer at Southern California Edison in Rosemead, Calif. "Our next long-term plan will be run only on an Elfin model." Edison runs Elfin on MVS on an IBM 3090 Model 600.

EDF's adversary in the original 1970s case, San Francisco-based PG&E, has not embraced Elfin quite so enthusiastically but does run it on its VM/CMS-based Amdahl Corp. mainframe for regulatory filings.

"It's not PG&E's preferred model for planning purposes," says Lawrence Risman, a consultant in computer modeling for production simulation. "It's required by the regulators, has convenience and a fairly quick turnaround time."

Elfin has helped PG&E and EDF work more closely together than in the contentious days of the past, according to Risman. "There's been quite a bit of water over the dam since then," he says. "We're happy to work with a model from whatever source."

PG&E and Southern California Edison pay EDF about $18,000 per year for Elfin mainframe licenses; other third-party mainframe or minicomputer-based forecasting models typically cost around $80,000 annually, Pando says. The PC version, which requires an Intel Corp. 80386-based machine, ranges between $6,000 and $10,000 per year. EDF brings in about $120,000 per year in licensing fees, all of which fund continued enhancement and development of Elfin, according to Kirshner.

"You could say [Elfin has] been a success as a software product, but if we were for-profit, we wouldn't consider it a very worthwhile endeavor," Kirshner says. "We have a California niche, but it would be nice to exploit that elsewhere."

EDF's true measure of success, however, lies in opening up energy planning in California through the use of information technology. "We used to hear that the power companies had to build these plants or the lights will go out, and we only had their models to go by," says House. "Now we can test different conservation assumptions, gas price assumptions, anything. We have a completely open process."

"The [energy planning] game is not models, it's assumptions," Kirshner says. "But that was never clear until everyone was using the same model."

Peterson

FROM PAGE 73

Detroit area. His career has taken him from Detroit to California to New York, where he and his wife now reside in an Upper East Side co-op. An avid skier, tennis player and golfer, Peterson manages to return to his Los Angeles-area home a few times a year to pursue those interests.

After graduating from MIT and serving a brief stint as a civil engineer corps officer in the Navy, Peterson joined Honeywell, Inc.'s temperature control business in Detroit, as his father had done. When Honeywell started getting involved with computers in the 1960s, Peterson was intrigued and returned to school with plans to get into the dawning industry.

Armed with an MBA from the University of California at Berkeley, Peterson went back to Detroit to work in IS at Ford Motor Co., modernizing the company's operations and product development systems. His varied career has been uphill ever since, marked by distinguished terms at Citicorp, RCA Corp. and, most recently, Security Pacific Corp., where he was executive vice-president of the bank's Automated Data Processing Group for several years.

Peterson came to Merrill Lynch in 1986. "There's been a lot of change since he's been here," Eli says, noting that both IS budget and staff have declined, and the group is more control-conscious.

Damage control

As Wall Street continues to undergo brokerage industry contractions, Merrill has been one of the hardest-hit firms, because of its freewheeling expansion during the boom years of the 1980s. Peterson's charter has been to control costs while continuing to deploy technology to Merrill's strategic advantage.

In light of layoffs and budget cuts, some might resent Peterson's large salary, but colleagues defend it. "He deserves every penny of it. He's added 10 to 100 times more than that to the firm," Turkstra says.

Peterson says that his status gets him "a lot of notoriety," but colleagues describe him as first and foremost a family man. No doubt he has helped inspire two of his three children to become involved in the business: One is in telecommunications at Procter & Gamble Co., another in the computer center at Pacific Bell.

Peterson is apparently not without a mischievous bent — at least according to another high-profile IS executive with a penchant for same. George DiNardo, executive vice-president of information management and research at Mellon Bank NA and a friend of Peterson's, speaks of participating with Peterson in an IS research group in New York.

"We were always fooling around at meetings; now they make sure we sit at opposite sides of the table," DiNardo laughs. But he adds, "He's absolutely a gentleman and a wonderful person."

Peterson's management philosophy? "I like to hire the best people I can get my hands on, give them the authority and the tools they need to get the job done — then let them have some fun," he says.

Subordinates agree. "DuWayne has a unique ability to let his people show initiative while establishing a vision," Turkstra says.

Eli characterizes Peterson's informal, entrepreneurial style as "more California." "He sets goals and expects everyone to live up to expectations," he says.

Where do you go from the top? Peterson says he will finish out his working life at Merrill. "I'd like to retire eventually, maybe do some consulting," he says. But when that time comes, he says, "You stop and take stock of your life. This business moves so fast."

CALENDAR

APRIL 8-14

Service as the Emerging Strategic Weapon. Boston, April 9-10 — Contact: The Ledgeway Group, Lexington, Mass. (617) 862-8500.

Network Management Solutions '90. Anaheim, Calif., April 10-12 — Contact: Dorothy Ferriter, International Data Corp., Framingham, Mass. (800) 225-4698.

Macworld Exposition. San Francisco, April 11-13 — Contact: Mitch Hall Associates, Dedham, Mass. (617) 361-8000.

Softrend '90, The Business Person's Computer Show. Anaheim, Calif., April 11-13 — Contact: The International Database Management Association, San Diego, Calif. (619) 578-3152.

APRIL 15-21

Supercamm '90 Conference and Exhibition. Atlanta, April 16-19 — Contact: United States Telephone Association, Washington, D.C. (202) 835-3100.

T1, Fractional T1, T3 and ISDN. Research Triangle Park, N.C., April 17-19 — Contact: Distributed Networking Associates, Greensboro, N.C. (800) 476-0338.

APRIL 22-28

Academic Microcomputing Conference. Columbus, Ohio, April 22-25 — Contact: John Schar, Ohio State University, Columbus, Ohio (614) 292-4843.

Decision Support and Executive Information Systems: A Managerial Perspective. Cambridge, Mass., April 23-24 — Contact: Decision Support Technology, Cambridge, Mass. (617) 354-6400.

Fiber Optics to the Year 2000. Monterey, Calif., April 23-25 — Contact: Electronic Cast Corp., San Mateo, Calif. (415) 572-1800.

International Technical Project Management Conference. Boston, April 23-25 — Contact: William A. Hurwitz, Center for Project Management, Tyngsboro, Mass. (508) 649-9731.

IEEE Seminar on International Telecommunications. New York, April 24 — Contact: Bert Lindberg, IEEE, New York, N.Y. (212) 825-1527.

The Creative Role of MIS in Demassification. Minneapolis, April 24-25 — Contact: MIS/CIM, Minneapolis, Minn. (612) 851-1515.

Conference for Users of Information Systems. Orlando, Fla., April 24-26 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Speech Tech '90. New York, April 24-26 — Contact: Media Dimensions, Inc., New York, N.Y. (212) 533-7481.

National Conference on Systems Integration. Washington, D.C., April 24-27 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

International Conference on Information Systems Quality Assurance. Orlando, Fla., April 25-27 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

ELECTRONIC DATA INTERCHANGE

Take a close look before getting on the wire

BY ROBERT PAYNE

Conducting business electronically is not an idea that rests easily on executives' minds. While it has gained more widespread acceptance (some numbers place the rate of growth at 45%) electronic data interchange (EDI) has not been the fastest off the block.

A welter of questions arise when a company considers committing to exchanging business information electronically. Standouts include: Are EDI transactions secure? Do they require extra care? Can I change my existing system to accommodate EDI traffic? Does working with trading partners need a lot of effort? And what is "store-and-forward," anyway?

If your company has recently committed to EDI, you have no doubt wrestled with some of these questions. And no doubt another large decision looms: whether to create your own EDI setup or pay a third-party network to do your transactions for you. You do not have to be the size of Wal-Mart Stores to reap the cost benefits of building your own EDI network. At the same time, you may prefer the expertise and added value offered by the third-party network providers.

To ease your way into EDI, you must first understand just what EDI requires of a network, whether you make or buy it.

By their very nature, EDI transmissions need to be handled with extra care. Beyond getting orders right, companies using EDI to notify banks to pay suppliers expect 100% accuracy. With customer orders, remittances and acceptance notices coming and going over the wire, timeliness of data is also essential.

The network must also handle unpredictable peaks and lulls of EDI traffic. With more emphasis on just-in-time operation, customers make more frequent orders for a smaller volume of goods. Others send large batch orders, once a day, once a week or occasionally once a season. For instance, a candy firm tells how K Mart Corp. put in a single order for Valentine candy to fill all of its stores. The firm will probably not receive another order from K Mart for several months.

Because it is system- instead of sales force-dependent, EDI traffic continues throughout the night. This need for 24-hour access and uptime has spurred the popularity of "dial-in" capacity. Customers can access and pick up outbound documents at their convenience, without assistance from the sending company.

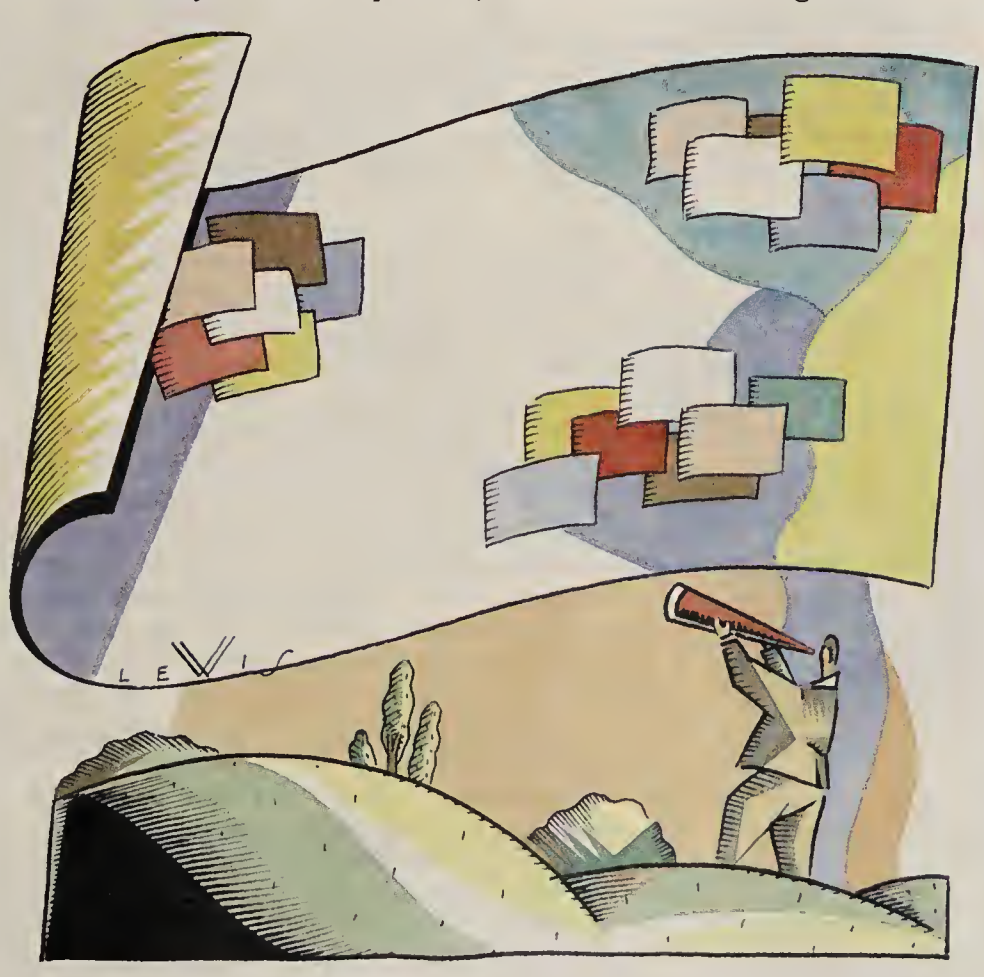
With this capacity, only the network must be maintained around the clock; the application systems themselves can be disconnected. This is a relief to the information systems group, which would not want to provide 24-hour production support for a complex purchasing system.

As EDI progresses in the organization, the network will need to examine inbound transactions in the electronic mailbox and distribute them to diverse departments, taking on the characteristics of an electronic post office.

Just as volume varies among trading partners, so do other physical characteristics of the data. For instance, there are many types of emulation software, including IBM Systems Network Architecture, asynchronous or bisynchronous software, and the network needs to handle each type.

The network must also accommodate a variety of line speeds. Most of the automotive manufacturers send material releases at 2.4K bit/sec., while other industries transmit their data at 4.8K bit/sec. Even when a manager knows that a 2.4K bit/sec. connection needs to be available, other questions arise — such as, will it be 2780- or 3780-based?

Another factor that distinguishes the EDI network is its need for expandability. Many EDI programs in the U.S. are growing at a rate of 10 trading partners per month. Southern California Edison set a record in 1989 when it added 100 trading partners in 90 days. By mid-1987, Wal-Mart Stores had several hundred telecommunications connections with trading



Tim Lewis

Payne is a managing partner with EDI, Spread The Word, an EDI research and consulting firm in Dallas.

INSIDE

They Wear it Well
Retailers are putting CAD/CAM, bar codes in EDI. Page 90.

Starting Small
Some choose PC translation software to keep costs low. Page 90.

The Great EFT Debate
Do you keep data and value together or send it separately? Page 92.

Wire

FROM PREVIOUS PAGE

partners and is adding new ones. By late '89, it had the greatest number of standard EDI trading partners of any company, with a total of 1,810.

Furthermore, the number of transactions for each trading partner increases over time. Pilot projects grow to parallel tests and then to production volumes.

Beyond physical network requirements, there are also human operational requirements. Remember how long it took to install your latest intracompany network drop? While you do not have to multiply this by your total number of EDI trading partners, you may need many months of installation time, including training time.

Although there have been no reports to date of unauthorized trading partners gaining EDI access, managers are very concerned with security on EDI networks. Because of the nature of the data, it is important to have error correction, security and audit trails on the network. A good deal of security is built into EDI formats as well (see story page 86).

Other good practices on the network are uninterruptible power supplies and line or switch redundancy.

With these requirements in mind, managers can decide whether it is to their advantage to make or buy each component of the network.

While most new users are opting for third-party networks — almost 85%, according to estimates from the *EDI Yellow Pages* database — there are cases when building your own will save money.

One example is when your company already has a substantial network set up for intracompany communication. Since the prime technical difference between the two types of networks is the number of drops, you may just need to increase network capacity and the number and location of lines.

You should first assess whether there is unused capacity on the current network that could be allocated to EDI traffic. If not, you need to calculate the cost of adding capacity as well as lines local to the trading partners.

Other considerations need to be attended to as well, such as expandability, variable peak traffic times and 100% uptime. Managers should plan on adding more lines than they would use for a similar intracompany requirement. Also, because of possible increases in volume, additional controllers and ports may be required.

To accommodate the various line speeds and emulation software of each trading partner, you will need a variety of modems and multiplexers to accept transactions. You will also need to spend time with each partner to carefully coordinate the particular network strategies.

In the late 1980s, Sears Roebuck and Co. opted to expand its existing capacity to accept EDI traffic. Not only did its intracompany network carry information among headquarters, distribution centers and stores, but it also reached Allstate Life Insurance Co., Dean Witter Reynolds, the Discover card and more. The network has over 135,000 terminals in 7,000 locations and reaches about 800 Sears suppliers, according to Lance Dailey of the Sears Merchandise Group.

Even this network will need to expand to carry more EDI traffic. In all likelihood, the number of locations on the Sears network will more than double to fully implement EDI.

At the other extreme, companies that plan on sending a large volume of transactions to a small number of trading partners may choose to build EDI networks specific to those companies.

For this to be cost-effective, the company should not be planning to expand to include more partners.

All in all, building your own EDI network is not something to be taken lightly. Before even considering technical issues, there are EDI-specific concerns to address. For instance, coordinating trading partner relationships almost always takes longer than expected.

In addition, each procurement of equipment means evaluating, selecting, installing and testing the equipment and then training your staff to use it. The new equipment will add operating costs and depreciation costs as well as amortization of leases, which will be charged to the manager. Monthly payments to telephone companies may be another ongoing cost. Finally, there is maintenance to consider. If you have little internal telecommunications expertise, there may be consultant fees.

For companies looking for simplicity, the route to take is to sign on with one of the 15 available third-party EDI network providers. These providers have a lot of experience in meeting the requirements above. Even the K Mart candy order is not a particularly large volume for a third-party network.

A range of several hundred to a few thousand users make use of these networks, and the providers will expand as necessary.

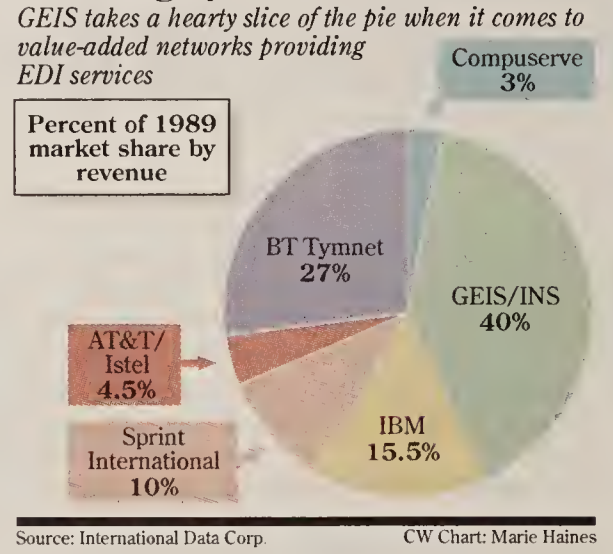
Other equipment, such as concentrators, trunk lines and central processors, is also expandable on these networks.

The networks also offer around-the-clock access seven days a week except for a few hours weekly that are necessary for maintenance and backup. Most of the networks are capable of store-and-forward

Continued on page 86

Traveling by VAN

GEIS takes a hearty slice of the pie when it comes to value-added networks providing EDI services



Source: International Data Corp. CW Chart: Marie Haines

Why EDI?

In its report, "The State of U.S. EDI: 1989," EDI Research, Inc. asked 423 users who are either using or planning to use EDI to provide the main reasons why they are doing so. The survey was designed to elicit open-ended responses, allowing respondents to express their own answers. The responses were then grouped to represent as nearly as possible the words of the respondents.

Coming in at 49.9%, "speed and reduction in lead time" was the most common answer, receiving more than three times as many mentions as any other category. The second and third most frequently mentioned benefits — which resulted in a tie — were "customer request" and "cost efficiency" at 15.1%. Increased "accuracy" at 12.5% was the next most popular response, and customer service came in fifth at 3.6%.

It is interesting to note that some popular features of EDI are not perceived as very important by respondents. For instance, "inventory cost control and reduction" was noted by only 3.1% of respondents, yet it is mentioned frequently by proponents of EDI as a major benefit of implementation.

Don't sign until you've read all the fine print

BY BEN WRIGHT

As an EDI user hiring a third-party network provider, you need a robust service agreement. These providers are not regulated by the Federal Communications Commission, so the agreement is the keystone to the service relationship.

In addition, once you have decided on one provider, it becomes difficult to switch. Not only do you spend time and money establishing a working relationship, but a move to a different service could disrupt your trading partners as well. So it's important to get it right the first time.

A provider usually has its own standard form, which covers issues important to it and employs language that favors its interests. It is imperative, therefore, for the customer to review the agreement carefully and revise it as necessary. The following should be considered in the final agreement:

• **Complete statement of terms:** The agreement should state all the network provider's obligations, including the responsibilities for user support and data transmission, translation, storage and delivery. One way to ensure that all points are covered is to reference the network provider's product literature within the actual agreement.

• **Data ownership:** Just as an unpaid mechanic can assert a lien for servicing an automobile, a network provider could retain data if the customer fails to pay the network's charges. To preclude the possibility of business disruption in the event of a billing dispute, the agreement should confirm the customer's absolute right to data.

• **Confidentiality:** The service contract should establish precise obligations to protect data confidentiality.

While laws such as the Electronic Communications Privacy Act (ECPA) protect the privacy of electronic messages, their application is complex and sometimes confusing. Few court decisions have interpreted them clearly.

What is more, although these laws inhibit a network provider from voluntarily disclosing data, they do not require security measures to be used on the networks.

It may be wise to mandate the regular purging of backup files. EDI transaction and pricing data could prove quite a tempting target for a corporate spy or anti-trust plaintiff's lawyer.

• **Investigations and audits:** It is possible that a taxing authority or investigative agency would order a network provider to release a client's information.

Customers can attach a clause to their contracts that requires the provider to notify them before releasing any information so that they can monitor or contest such attempts.

Under the ECPA, however, law enforcement authorities can delay customer notification. This provides extra incentive to insist that the provider erase backup reasonably quickly.

• **Liability for errors:** The agreement should divide the responsibility for risk — including data loss, delay, misdirection and total cessation of data traffic — between network provider and customer.

Typical network form contracts obligate the network to restore, rerun or correct lost or impaired data. But providers are hesitant to offer additional remedies, such as paying damages for breach of contract. Their rationale is that with increased liability, they would have to charge higher rates.

However, customers should insist that providers be liable up to some point for their mistakes. After all, the provider is often in the best position to prevent errors.

In addition, exposure to liability will motivate the network provider to maintain quality service. Keep in mind that you will probably not receive a full guarantee of flawless performance.

• **Amendment:** Services will inevitably change, and the agreement should be made subject to amendment in the event of changes. In addition, customers should be given advance warning (approximately 90 days) on any adverse changes made to the network, such as altered protocols.

• **Termination:** The customer should be given sufficient warning of the termination of the contract and possibly even the option to extend services beyond the effective expiration date.

Certain obligations should continue after the agreement ends. These might include confidentiality and the availability of documentation for audit, legal and tax purposes. •

Wright is a Dallas-based attorney.

Adapted from EDI and American Law: A Practical Guide. *Copyright (C) 1990 TDCC: Electronic Data Interchange Association, Alexandria, Va. This article provides general information and not specific legal advice.*

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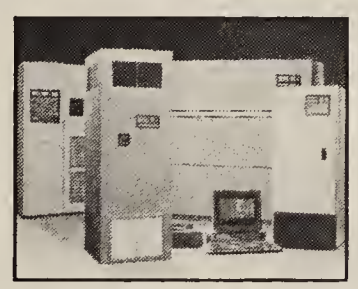

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— Frank Martin, Manager/Data Processing
Noxell Corporation, Hunt Valley, MD

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Battening down the hatches

Security is a top concern for EDI implementors. Beyond network security, EDI formats themselves offer built-in checks and balances.

One of these is via control numbers, which appear in the header and at the bottom of the document. This works as a tracking device should questions arise as to the timing of the document's movement or receipt. The number also appears on audit trails, for ongoing data processing auditing.

In addition, if the bottom of the document gets eliminated, the network would recognize this. It reads the control number in the header and matches it to the number at the end. If the network finds that the numbers do not match, it alerts network operations personnel as well as the sender of the document.

EDI also has control totals. As the sender builds the electronic document, EDI software counts the number of records and then notes that total in the trailer segment. The recipient can then see whether a record has been eliminated.

The checking mechanisms intrinsic to the document can go two steps further. An inner envelope will have its own control number and control totals in its trailer.

In addition, some of the data values can be totaled and then stored in trailer records. An example is the total quantity ordered in a purchase order.

A more common and definite confirmation is provided by the receiver sending back a functional acknowledgment, analogous to a postal return receipt. If the manager sends a document and does not receive an acknowledgment, he retransmits or looks into the problem.

Unauthorized access is another concern. One solution is to allow dial-in access to only a small portion of the network. In addition, before information is sent to in-house applications, it is examined closely for valid ID, control numbers and control totals.

ROBERT PAYNE

Continued from page 82

services, in which they dial out to a trading partner on behalf of the manager. All of them can store and receive. In addition, peak traffic times tend to level out across this larger, more random trading-partner community.

The providers are also capable of receiving transmissions from virtually all commercially available modems and can adapt to basically all protocols. Because companies communicate with only the third-party network and not individual trading partners, different line speeds and protocols are transparent.

The third-party EDI networks are also in the business of protecting against electrical storms, power outages and other disasters. They use error-correcting software, and security is rigid and subject to external audits.

Networks are accustomed to providing audit trails, transmission recovery and redundancy to a great degree. Lines are continuously monitored by sophisticated equipment and experienced people.

In addition, the networks have all developed software to carefully use the checks and balances intrinsic to EDI headers and trailers. Third-party EDI network software detects if a trailer happens to be missing or if the count of the segments is incorrect. These networks clearly indicate such occurrences on the audit trails that are available to users.

Pricing algorithms vary on the networks, but in general, the cost of sending and receiving a simple two-line item purchase order varies from about 55 cents to 90 cents. Most network providers charge a monthly fee and offer volume or monthly discounts.

Despite the services offered by third-party networks, there will always be companies that prefer to do things on their own. For this reason, a handful of vendors have begun offering software that simplifies some of the technical issues involved with setting up your own network.

Vendors offering such software are American Custom Software in Cookeville, Tenn.; Mpact EDI Systems in Livonia, Mich.; Stratus Computer/Scientific Software; and Ordernet Gentran in Columbus, Ohio.

Generally, this software assists in scheduling telecommunications sessions and allows trading partners to dial in to retrieve messages. It offers some contingency requirements by checking control numbers and control totals intrinsic to EDI headers and trailers. It also produces audit trails that are modifiable by the manager. Expandability is also possible.

Some of the packages also perform protocol conversion and handle multiple line speeds, obviating the need for some emulation software. Pricing for the software ranges from $3,000 to $128,000. The more expensive software can accommodate more lines and reduce the number of emulators and modems required.

Perhaps to counteract such competition, the third-party networks have started to offer additional services and technology on a fee basis. For instance, the third parties help in trading partner coordination as well as consulting and in-house training to the originating company or trading partners.

At your service

Some of these providers also offer database services. In these cases, they collect and analyze EDI data that passes through the network, such as trends in geographical, seasonal and company-size orders and then allow companies to access them.

Ordernet offers a database of pharmaceutical usage built from actual EDI data moving among members of the pharmaceutical industry. It reads usage patterns among transactions and records and provides marketing information to be made available to the members of the industry.

GE Information Services and IBM (through Quick Response Services) provide databases of universal product codes (see story page 90).

Another service offered by the third-party networks is internetworking. If a trading partner will work only through a specific third-party EDI network, some networks enable you to communicate with that trading partner. Taken for granted in voice transmission, this capability is quite recent to EDI.

When venturing into EDI, it is vital to remember that new ground is being covered — new concerns for network data, new requirements for the network, new relationships with trading partners and essentially an entirely new way of doing business.

The groundwork you cover before making any decision can alleviate the hours your EDI personnel will put in when you get down to the brass tacks of implementation. Taking a good look at your current mode of operations and network capacity and honestly assessing the capabilities of your IS department and the requirements that EDI imposes on any network is a good place to start. •

ASK THE VENDOR

I currently use American Business Computer's personal computer translation software product, EDE-PC. I am interested in purchasing EDI-Excel for use on my IBM 3083 (MVS) to move EDI further into my business operations. I have heard that EDI-Excel has a user interface that facilitates "no-hassle" data mapping. Please explain.

Lisa Scully
EDI Coordinator
Philips Lighting Co.
Somerset, N.J.

AMERICAN BUSINESS COMPUTER: EDI-Excel's Mapping Editor is an interactive method of relating application data location and format information to and from EDI standards. The Mapping Editor presents EDI information on the screen so that users can "cut and paste" data segments and data elements as well as specify their location and position to and from the application database. This way, users can create interpretations of EDI transactions and streamline the integration process. The Mapping Editor also performs consistency and completeness checks to ensure, for example, that data hasn't been mapped to the same location twice or mapped to the wrong location.

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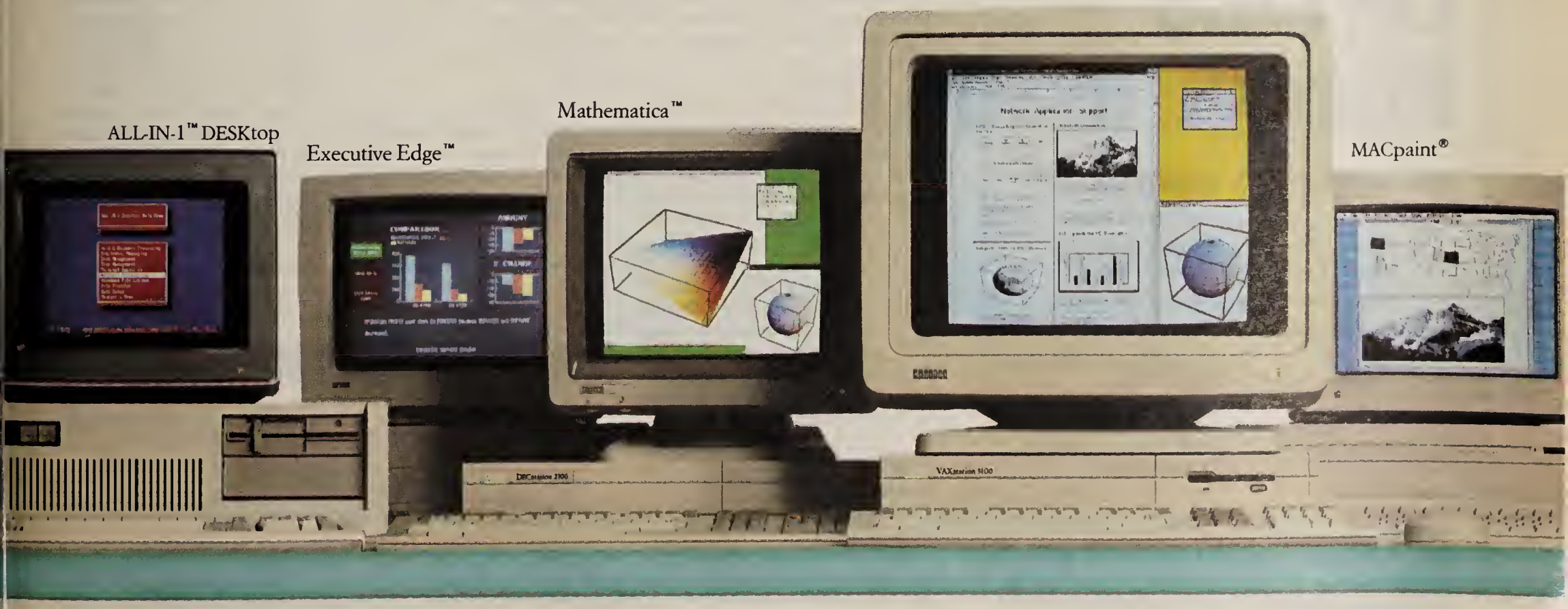

Retailers dress up EDI systems

BY LISA GUISBOND

Some companies that have already gotten their feet wet with electronic data interchange (EDI) are starting to wade even further into the technology. Among those venturing into deeper waters are apparel manufacturers and retailers, which are starting to integrate new technologies into their EDI systems to exchange bar-coded data, graphics and computer-aided design and manufacturing (CAD/CAM) information.

The reason behind this integration push is related to business, not technology, says Lane Cooper, senior editor at "EDI News," an industry newsletter.

"You not only want to integrate CAD/CAM, funds transfer and computer-integrated manufacturing in EDI," he says. "You also want to figure out ways to provide value-added services in addition to your product."

In the retail industry, the attempt to add value is called quick response — the U.S. retail industry's answer to competition from imported goods. Quick response is a strategy for streamlining the movement of goods from manufacturing to point of sale and cutting inventory costs.

With the recent trend in the retail industry of introducing a new style each month — as opposed to the past practice of one per season — quick response is more than a slogan, it's a marching order for such recognized leaders in EDI as Liz Claiborne, Inc., Milliken & Co., Hagar, Dillard's Department Stores, Inc. and Levi Strauss & Co.

Liz Claiborne in North Bergen, N.J., is looking to emphasize the "quick" in quick response by integrating new technologies into EDI. It has set its sights on exchanging CAD/CAM-based design information with textile manufacturers and its overseas contractors. The firm has used personal computer-based CAD/CAM systems for three years, says Victor M. Soto, director of CAD/CAM at Liz Claiborne.

Soto says he anticipates that within the next 1½ years, Liz Claiborne will exchange such CAD/CAM design information with overseas trading partners. Currently, the firm transmits cut patterns to its own operations overseas via satellite. The patterns are then delivered to factories for production. But this is not yet full EDI.

"The first job is to implement the [CAD/CAM systems] in-house," Soto says. After that, he envisions the exchange of CAD/CAM information as a way to accelerate the turnaround time in garment production.

Wrangler in Greensboro, N.C., is another apparel manufacturer that is part of the EDI vanguard. The company is expanding its EDI program, dubbed Wrangler Wire, to include bar-code scanning of inventory as part of an effort to get the right styles in the right quantities and the right sizes through the pipeline to the point of sale.

Wrangler currently relies on a purely manual inventory system, according to Brian Goldberg, vice-president of retail services. Wrangler's stock counters must travel to thousands of stores to manually count inventory and then phone in replenishment orders.

With the bar-coding program, Wrangler's retail partners will be able to scan their bar-coded inventory weekly — as opposed to every four weeks — using a handheld scanner based on the ANSI X12 standard for the apparel industry. Upon receipt of the data, Wrangler's system will automatically generate orders, taking into account the status of shipments — that is, what is in transit, unshipped or already received.

Wrangler is also participating in the development of a system to outfit retailers with instant access to the company's latest product line. Rather than waiting for a seasonal visit from a Wrangler salesperson, the retailer will be able to view digitized images of product lines on a full-color, high-resolution graphics workstation.

The workstations are being developed by IBM Information Network and Quick Response Services, a division of Peter R. Johnson and Associates, which is partly owned by IBM.

"The retailer will sit at a workstation and look at our product selections," Goldberg says. "If they want to view a specific product, say acid-washed indigo jeans, they would press that button and get a close, tight shot, like looking at a page of the catalog."

If they like what they see, Goldberg says, they could create an electronic purchase order and transmit it to Wrangler, initiating the whole EDI exchange.

John Simon, Quick Response Services' vice-president of development operations — and a former retail buyer and store manager — sees other potential system applications. "There's a big need in a retail environment to transmit descriptive information like pictures to various stores," he says. "They could use it in an ad, in training seminars and in in-store videos."

Service stretch

Third-party network services such as GE Information Services' (GEIS) Design Express are also expanding the boundaries of EDI by allowing apparel companies to transmit design patterns and related information to manufacturers worldwide.

Integrating these technologies will mean familiarizing people with a whole new method of doing business, says GEIS product marketing manager John Schmarr. This is not unlike the education required when EDI was just entering its infancy.

"That effort required a lot of internal changes to the way manufacturers and people did business," he says. With the added concerns of international standards and data that is considered proprietary, a lot of security needs to be built in, he adds. •

Guisbond is a free-lance writer based in Cambridge, Mass.

Getting by with just the basics

BY JAMES MOSES

If you have been dodging requests from a trading partner who wants your company to become EDI-capable, it may help to know that there are things that you can do to satisfy such requests without depleting your systems budget.

Rather than set up a mainframe- or minicomputer-based system that collects inventory statistics and performs business analyses, many companies are getting away with a more minimal electronic data interchange investment.

For companies unwilling to invest in any kind of EDI capability, some third-party networks offer media conversion services. These services allow companies to receive EDI messages. The hub company sends its EDI message through normal EDI channels to the third-party network, which then forwards the message via facsimile, telex or electronic mail to the recipient. Of course, such services work in only one direction; that is, the recipient cannot then send a message in return.

Another option is to set up a minimal EDI configuration with a modem, a personal computer and a basic PC translation software package. "If the small firm says, 'This is the only EDI customer that I will have to deal with' and if it's for a limited number of transactions, [PC translation software] is a good way to get started," says Dan Codman of the APL Group, Inc., a Connecticut-based EDI software vendor.

When this software sends a transaction, it translates it from the application format into a commonly agreed-on format, such as ANSI X12. Upon receipt of a transaction, it does the reverse.

The limitation is that you cannot perform a large volume of business analyses, such as studying incoming purchase orders to see what type of product is selling well, from which geographic region and at what time of the year. With their limited capability, he adds, these packages are relatively inexpensive and easy to use.

When Elec-tel Supply Co., an electrical products distributor, was asked by one of its major customers, Georgia Power Co., to look into EDI capability, it decided on a basic PC package from Georgia-based Grace Computer Resources, Inc. "We already had the PCs, so it was just the software costs and the connect charges," says Brian Wright, Elec-tel's EDI coordinator.

Rather than using a modem, Elec-tel chose GE Information Services' third-party network to transmit its data. The organizationeventually switched to IBM's third-party network, which Georgia Power was also using. "Originally, we were paying $100 a month for GE's network," Wright says. "IBM charges us according to usage, so now we pay about $50 to $75

Continued on page 91

Moses is the founder of Primary Research Corp., a technology research firm in New York.

Back to basics

Even if you need mainframe communications, you can purchase translation software for $3,000

Service type	Approximate software costs	Capabilities
Basic PC	$500 to $1,500	Can communicate with one EDI partner
Enhanced PC	$1,000 to $2,500	Can communicate with multiple EDI partners
Full-service PC	$2,000 to $3,000	Can communicate with multiple partners and has the capacity to send data to mainframe or minicomputer for further processing

CW Chart: Doreen Dahle

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This also extends to translation applications that involve no real EDI standards at all but just the proprietary data formats of a company and its trading partners.

I use Trading Partner, TSI International's EDI management software product. I've heard about a feature it is incorporating called Applications Gateway. What is this feature, and how will it affect my existing implementation?

Dennis Peabody
Manager, Development Support Services
National Semiconductor, Inc.
Santa Clara, Calif.

TSI INTERNATIONAL: The Applications Gateway was developed to handle the difficulty of integrating EDI data with production applications. The Applications Gateway will allow you to define the mapping of EDI data using interactive screens. You can perform file and table lookups; EDI data can pass through the same edits as other application data; and you can create screens for viewing, modifying or approving EDI data before processing.

I know that Universal Software's EDI file transfer package, Universal-Link, runs on bisynchronous networks, but does the company plan on supporting SNA when and if EDI comes to the world of SNA?

Bill Schneider
Data Processing Manager
Central Transport, Inc.
Warren, Mich.

UNIVERSAL SOFTWARE: VTAM/SNA support for Universal-Link is under development and is expected to be available by June of this year.

Getting by

CONTINUED FROM PAGE 90

per month."

When they first started using the EDI system, Elec-tel and Georgia Power used paper along with the EDI transaction — a common practice for small firms just getting accustomed to EDI.

"A parallel system existed for a long time — about a year and a half or so — while we got the bugs out," Wright says. "The software hadn't been fully debugged, and there were things like printing errors in the translation software."

Starting small does not necessarily mean that you have to stay small. Many packages are upgradable to accommodate more trading partners or become integrated with a company's corporate mainframe.

Strong Tool Co., a distributor of industrial tools in Cleveland, found that its EDI needs evolved beyond the initial setup.

The company started out with PC translation software from GEIS to satisfy General Electric Co., a major customer. The implementation was so successful that Strong Tool decided to expand to exchange EDI information with two automobile companies as well.

While it could have expanded the GE software, it instead chose a package from American Custom Software. For one thing, according to Dana Basinger, Strong Tool's EDI coordinator, the vendor specializes in auto industry standards. In addition, it offered a maintenance/update option for only $150 more than the standard $2,000 purchase price.

Originally set up to communicate with Ford Motor Co. and General Motors Corp., the software later underwent a $350 upgrade to include Chrysler Corp.

Many packages are upgradable for an added cost of $300 to $1,000. If no upgrade is available, the user must purchase a whole new program.

Over time, Strong Tool opted to route incoming EDI data to its corporate mainframe.

While Strong Tool developed this capability in-house, many EDI software suppliers offer upgrades to the mainframe or minicomputer. The average cost for this kind of upgrade is $300 to $500. •

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EFT: If money could talk . . .

BY WILLIAM BRANDEL

Many companies are hesitant about implementing electronic funds transfer. To several, the idea of paying trading partners electronically upon receipt of an invoice raises more doubt than enthusiasm.

As long as a payer can take advantage of the time it takes for a check to arrive via mail and then clear a bank — the "float" period — the benefits of EFT will remain questionable. There are also issues of expense to consider when implementing EFT, such as accounts payable system changes, education of purchasing staff and vendor renegotiation of payment terms.

Brandel is a free-lance writer based in Boston.

But many large corporations that are receiving and sending payments via EFT — such as General Motors Corp., Sears Roebuck and Co., General Electric Co. and IBM — swear by it, and they are encouraging others to join.

"Seventy percent of one business computer's input is actually the output of another business computer," says Jerry Hershney, an analyst at Sears in Chicago. "If you eliminate the paper, you eliminate mailing time and reduce clerical expense as well as clerical errors and the time needed to correct them."

However, even EFT proponents are grappling with a question that has yet to offer an easy answer: How do you coordinate the electronic transmission of payments with the information that accompanies it? "The fundamental issue is no longer the technology; the technology is there," Hershney says. "The issue is, should the payment accompany the remittance data that goes with it, or should it be referenced and sent via a different route?"

Remittance data is information on what is being paid for, how funds should be processed and to which accounts receivable area they are to be applied. While the payer and payee banks take care of funds transfer on either the automated clearinghouse (ACH) network or on the Federal Reserve's Fedwire, there are several ways to transmit the data. A company can send it via paper, a third-party network, the ACH network or a proprietary EDI network.

Some of the argument has technical origins. Originally structured for banks to exchange funds among themselves, the ACH cannot accommodate large volumes of data traffic. The oldest format, Cash Concentration and Disbursement (CCD), limits data to 94 characters. The latest two are Corporate Trade Exchange (CTX), which offers variable-length records, and CCD+, which adds standard-format 94-character records. The only problem is that not all banks are yet able to process these formats.

Some observers see the separate vs. together debate as a business issue. "The issue is, how do I want to conduct my business payments?" Hershney says. For some vendors, he says, it may be advantageous to get the remittance data early to start processing payment. At a company the size of Sears, however, Hershney says that it is better to receive both at the same time.

"It eliminates the reconciliation problem," he says. "It's difficult enough to reconcile a personal checkbook. Imagine if you have millions of accounts that the funds could possibly be applied to." More often a payer than a payee, the firm has not been dogmatic about its approach.

General Electric Financial Services (GEFS) is also flexible on the issue. "We do it both ways," says Charlie Harp, manager of electronic payment systems at the company. "We will take it any way that our customers will pay us." Each of the firm's five payment centers accepts any ACH data format.

By offering its partners a choice in sending data and value or just value, GEFS feels it could get a broader base of vendors to pay electronically.

"The initial idea is to get the broadest penetration possible," Harp says. "We've found we can get a broader active participation from our vendors' banks if we did not require" the CTX or CCD+ format.

About 14,000 banks in the U.S. are on the ACH network, whereas 30 to 40 are compatible with CTX, Harp says.

Currently, he says, 8,000 GE customers are making payments electronically. Not all companies that are getting into EFT are going for such a large-scale implementation, however. At Union Carbide Corp., simple is the byword.

"We've started with other companies in the chemical industry with whom we have reciprocal payment relationships," says Robert Morris, manager of money and banking operations at the company.

In addition to the technical aspects of EFT, Morris says, questions arose during implementation such as system compatibility between payer and payee banks. Further, Morris cites the currently insufficient Universal Commercial Code, which does not judiciate EFT between computer systems. •

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Advanced Communications Systems (800) 223-5424	PCX12, Alternet	Cross-industry, specifically automotive, electrical, chemical, retail	360	IBM PC XT, PC AT, PS/2 and compatibles	DOS	ANSI 74 Cobol	ANSI X12, AIAG, EDX, TDCC, VICS, WINS	No	No	Flat file interface	Unattended operation, user customization of screens, automated purging, inbound and outbound transaction set reporting, templates for outbound documents, turnaround documents supported	All major third-party networks	No	Password, user ID	Unlimited	$1,650
American Business Computer (313) 930-7840	EDE-PC	Automotive	1100	IBM PCs and compatibles, Unix platforms	DOS, OS/2, Unix	C, Workstation Basic	ANSI X12 and all subsets, AIAG	No	Yes	On-line user interface	Unattended operation, user customizatioo of screens and menus, modification of rejected data	All major third-party networks	Yes	Password, user ID	One day (customizable)	$2,000-$5,000
	EDI Excel	Cross-industry	1100	IBM PCs and compatibles, Unix platforms	DOS, OS/2, Unix	Informix, C	ANSI X12 and all subsets, EDIFACT	Yes	Yes	On-line user interface of screens and menus	Same as above	All major third-party networks	Yes	Password, user ID	One day (customizable)	$4,500-$6,000
American Custom Software (615) 537-6516	EDI Business Partner Translator	Cross-industry	600	IBM PC XT, PC AT, PS/2 and compatibles	DOS	C, assembler	ANSI X12 and all subsets, TDCC	Yes	Yes	User-defined file structures, automated import and export	Unattended operation, user customizatioo of screens and menus, modification of rejected data	BT Tymnet, CDC, GEIS, IBM, Kleinschmidt, Ordernet, Railinc, Sears	No	Password, user ID, read only, write only user rights, assigned by field/file	Three days	$2,995
CAN/AM TECH (USA), Inc. (412) 794-5884	E-Z Order	Cross-industry	30	IBM PCs and compatibles	DOS	Turbo Pascal	ANSI X12, TDCC	No	Yes	None	Unattended operation, user customization of screens and menus, electronic catalog	GEIS, Trade Route and other major networks	Yes	None	One day (customizable)	$3,000
Control Data Redinet (800) 321-2012	Redi-Micro	Cross-industry	NP	IBM PCs and compatibles	DOS	C	All public and private	Yes	Yes	Maps to and from define a file and record structures	Unattended operation, user customization of screens and menus, modification of rejected data, bisynch and asynch communications, data entry option, print option, E-mail	CDC Redinet	No	Password, user ID	One day	$700
Data Dispatch Corp. (703) 749-3888	EDI/Synapse	Cross-industry	80	IBM PC AT and compatibles	DOS	C	ANSI X12, EDIFACT, TDCC, proprietary	No	No	Formats screen to EDI format, EDI message into a file format, from one standard into another format	Unattended operation, user customization of screens and menus, modification of rejected data	GEIS, Ordernet	Yes	Password, user ID	Five days	Set by distributor
Digit Software, Inc. (301) 593-8952	Mac-EDI	Cross-industry	10	Macintosh SE, Apple II models	Macintosh	C	ANSI X12, TDCC, UCS, VICS, WINS	No	Yes	Menu-driveo, user-defined file & record structures, fixed & variable file formats	Unattended operation, modification of rejected data	All major third-party networks	Yes	Password	Customized	$1,950
DNS Associates, Inc. (617) 862-8569 (215) 327-1022	EDI/Edge	Cross-industry	500-600	IBM PCs, PS/2s and compatibles	DOS, Unix, Xenix, AIX	C	ANSI X12 and all subsets, EDIFACT, TDCC	Yes	Yes	Maps to and from user-defined records	Uoattended operatioo, user customization of screens and menus, modification of rejected data	All major third-party networks	Yes	Password, multilevel user ID, eocryption, MAC, security segments	Two-day class, oo-site as needed	$3,000
Dynamic Business Systems (800) 969-8280	Trans-Sync	Cross-industry	50	IBM PC AT, PC XT, PS/2 and compatibles	DOS, Unix, Xenix	C	ANSI X12 and all subsets, EDIFACT, TDCC	Yes	Yes	Table-driven, user-defined file format and record structures can be created or accepted	Unattended operation, user customization of screens and menus, modification of rejected data	All major third-party oetworks	Yes	Password, user ID	One day	$2,500
EDI, Inc. (301) 670-0811	Telink	Cross-industry	1300	IBM PCs and compatibles	DOS, Unix	C, Basic, Fortran	ANSI X12 and all subsets	Yes	Yes	Flat file interface, fixed record format	Unattended operatioo, user customization of screens and menus, modification of rejected data, checkpoint and restart recovery after power or line interruption	All major value-added networks	Yes	Password, user ID, encryption	Two days	$2,600
Electronic Data Systems Corp. (800) 263-7946	EDI*Asset	Cross-industry	360	IBM PCs and compatibles	DOS	C	ANSI X12, TDCC	Yes	No	Fixed flat file format, user-defined interface	Unattended operation, user customization of screens and menus	CNCP, GEIS, IBM, Kleinschmidt, McDonnell Douglas, Ordernet, CDC Redinet, Sears, Telecom	Yes	Password, encryption, authentication	No training available	$3,100
	EDI*Expert	Cross-industry	3/1 availability	IBM PCs and compatibles	Unix	C	ANSI X12, TDCC	Yes	No	Fixed format and on-line user interface	Unattended operation, user customization of screens and menus	CNCP, GEIS, IBM, Kleinschmidt, McDonnell Douglas, Ordernet, CDC Redinet, Sears, Telecom	Yes	Password, encryption, authentication	No training available	NP
Foodcom (215) 644-1231	FrEDI	Cross-industry, specifically for food industry	100	IBM PCs, PS/2s and compatibles	DOS, OS/2 within DOS compatibility box	Micro assembler, RBasic	ANSI X12 and all subsets, EDIFACT, TDCC, proprietary	Yes	Yes	Maps EDI elements into user-defined dictionary, flat file interface, printouts	Unattended operation, user customization of screens and menus, modification of rejected data, ad hoc reporting, query by example	IBM	No	Password, user ID, encryption	Customized	$2,500

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

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Foretell Corp. (708) 272-1850	ESP II	Banking, health care, manufacturing, retail	900	286-, 386- and 486-based PCs, IBM PS/2	Microsoft Windows	C	ANSI, EDIFACT, UCS	Yes	Yes	Dbase delimited, fixed length, user-defined flat file	Unattended operation, user customization of screens and menus, modification of rejected data, custom reporting, forms painting	Agridata, Edinet, IBM, GEIS, Ordernet, Sears, Tradacom	Yes	User ID	Two days	$2,025
GE Information Services (800) 334-5669	EDI*PC	Cross-industry	2000	IBM PC AT and compatibles	DOS	C	ANSI X12, CEFIC, EDIFACT, UCS, VICS, TDCC	Yes	Yes	Maps to and from user-defined file and record structures	Unattended operation, user customization of screens and menus, modification of rejected data	GEIS, others with communications packages	Yes	None	One day	$1,450
Genzlinger Associates, Inc. (313) 879-7070	Release/ Shipment Communica-tions	Automotive, appliance	200	IBM PCs and compatibles	DOS, Unix, Xenix	Micro Focus Cobol	ANSI X12, Fixed length	No	No	Map into standard format, flat ASCII file: format is prespecified	Modification of rejected data, full packing slip and invoicing capabilities	GEIS, IBM	No	Password, user ID	Yes	$1,600
Grace Computer Resources, Inc. (404) 939-1743	EDI-Ware	Cross-industry	70	IBM PCs, PS/2s and compatibles	DOS	native Cobol	ANSI X12 and all subsets, TDCC, proprietary	Yes	Yes	Import & export, user-defined record, map directly to screen	Unattended operation, user customization of screens, modification of rejected data, E-mail	IBM, CDC	Yes	Password, user ID	Hourly basis	$1,500-$2,000
Harbinger*EDI Services (404) 320-1630	Intouch*EDI	Cross-industry	2000	IBM PCs and compatibles	DOS	C	ANSI X12, TDCC, UCS, VICS, WINS	Yes	Yes	None	Unattended operation	Harbinger network	Yes	Password, user ID, encryption	No training available	$995
IBM (800) 426-2468	Data Interchange/2	Cross-industry	2/15 availability	IBM PS/2	OS/2	C	ANSI X12, EDIFACT, ODETTE, TDCC, UCS, UNTDI	Yes	Yes	On-line user interface, translation occurs via flat file interface or direct application interface	Unattended operation, data entry facility, automatic functional acknowledgment	IIN, open communications architecture	Yes	Password, user ID, encryption, interchange password	Three days	$4,000
LDJ, Inc. (313) 528-2202	LDJ Messenger	Automotive	75	IBM PCs and compatibles	Unix	C, Basic	ANSI X12	Yes	Yes	None	Unattended operation, user customization of screens and menus	GEIS, IBM	Yes	Password, user ID	Two days	$5,000
LEK Product Marketing, Inc. (612) 895-0192	EDIpl Translator Software	Cross-industry	8	DOS platforms, Unix-compatible	DOS, Unix	C	ANSI X12 and all subsets, TDCC	Yes	No	ASCII flat file interface, default format, delimited ASCII flat file binary file/record	Unattended operation, table-driven user file formats, user-definable	McDonnell Douglas, Speed S	Yes	Password, user ID, sender ID	Site-dependent, daily rate	$1,000 (platform-dependent)
Lloyd Bush, Inc. (212) 962-4004	X-Change	Cross-industry	150	IBM PCs and compatibles	DOS	C	ANSI X12, TDCC	Yes	No	Maps incoming data to a file and screen	Unattended operation, archiving capabilities, turnaround document	BT Tymnet, CDC, Ordernet, Western Union and other major networks	Yes	None	No training available	$895
Metro-Mark (516) 741-5000	Micro*Tran, Quick*Tran, Pro*Tran	Cross-industry	800	IBM PCs and compatibles	DOS	NP	ANSI X12, EDIFACT, TDCC	Yes	Yes	Maps to user-defined formats	User customization of screens and menus, modification of rejected data	All major third-party networks	Yes	Password, user ID,security officer level entry	NP	$1,995
Piedmont Systems, Inc. (919) 760-3620	TEL-EDI	Cross-industry	200	IBM PCs and compatibles	DOS	C	ANSI X12 and all subsets, TDCC	Yes	Yes	Maps to and from user-defined file and record structures	Unattended operation	BT Tymnet, Compuserve, GEIS, IBM, Kleinschmidt, Redinet, Sears, Telenet, Western Union	Yes	Password	One day on-site, unlimited phone support	$2,495
RMS (313) 462-1200	VLT, Customizer	Cross-industry, national and international	500	IBM PC AT, PS/2 and compatibles	DOS, Unix	Micro Focus Cobol	ANSI X12 and all subsets, AIAG, EDIFACT, TALC, TDCC and other industry implementation	No	Yes	Table-driven user interface for defining data input for, and the output from, the VLT	Unattended operation, user customization of screens and menus, modification of rejected data	All major third-party networks	Yes	Password, user ID	One day (VLT), two days (Customizer)	$1,950
St. Paul Software (612) 641-0963	Interconn	Cross-industry	250	DOS platforms	DOS	C, Quick Basic	ANSI X12, AIAG, EDIFACT, TDCC, UCS, VICS, WINS	Yes	Yes	Creates and prints documents using defaults, or modifies screens and reports to suit mapping macro language	Unattended operation, user customization of screens and menus, modification of rejected data, bar-code generation of EDI documents	All major third-party networks	Yes	Password, encryption, LANs security	One day	$1,995
	Datatran	Cross-industry	10	Unix platforms	Unix	RM Cobol, C	ANSI X12, AIAG, EDIFACT, TDCC, UCS, VICS, WINS	Yes	No	Same as above	Unattended operation, modification of rejected data, bar-code generation of EDI documents	All major third-party networks	Yes	None	Two days	$5,500
Supply Tech, Inc. (313) 357-3430	STX12	Cross-industry	3,000	IBM PC/AT, PS/2 and compatibles	DOS	native Cobol	ANSI X12, TDCC, UCS	No	Yes	ASCII flat file to EDI format, EDI format to ASCII flat file, document to document	Unattended operation, user customization of screen and menus, modification of rejected data, document turnaround, bar-code interface	AT&T, British Telecom, GEIS, Infonet, Western Union	Yes	Password, user ID	Flat rate	$2,295
Synergistics Systems (904) 249-0201	EDI Bizibox	Cross-industry, specifically motor freight carriers	15	IBM PCs, PS/2s and compatibles	DOS	C	ANSI X12, TDCC, UCS, WINS	Yes	No	Table-driven	Unattended operation, time-scheduled operation	IBM, Ordernet, CDC Redinet, Transettlements	Yes	Mailbox, scheduled operation	Three to five days on-site, unlimited phone support	$18,000
Telecommunications Interface Corp. (708) 677-0800	Standards Driven Interface System	Cross-industry	30	IBM PCs and compatibles	DOS, Unix, Xenix	Cobol	ANSI X12 and all subsets	No	Yes	Table-driven	Unattended operation, modification of rejected data	BT Tymnet, GEIS, McDonnell Douglas, Ordernet	Yes	Password, user ID, encryption	Hot-line support for setup	$500
The APL Group, Inc. (203) 762-3933	Qualedi	Distribution, manufacturing, retail, transportation	NP	IBM PC AT, 80386-based PCs, PS/2s and compatibles	DOS	APL with assembler subroutines	ANSI, TDCC, VICS, WINS	Yes	Yes	Menu-driven fixed positional or variable length records	Unattended operation, user customization of screens and menus, modification of rejected data	AT&T, BT Tymnet, GEIS, IBM, Kleinschmidt, Ordernet, Railinc, Transettlements, McDonnell Douglas	No	Password, user ID	Tutorial software package in system, one-day seminar at company, one-day seminar at customer site, ongoing as part of maintenance contract	$1,650-$3,200

Clearing the dusty decks

Use an architectural approach to sweep out outdated systems

BY LAURENCE J. BEST

Scene: Los Angeles comedy club. In the spotlight is Sam Kinison with his trademark winter coat, beret and wild-man hair. As the applause from the introduction dies down, he launches into his "dusty-deck" routine.

"And how about those old systems! Spaghetti code — sequential updates — even master files! You'd think they'd never even heard of a database!"

Big laugh from the audience. He turns up the volume and says, "They were written in the '60s, and they're still around! I mean, how long are those dogs going to run?" More laughter, a smattering of applause, and he's in for the kill. Cupping his hands, he yells at the top of his lungs, "It's the '90s, for Pete's sake! CONVERT THEM!"

It's sad, but many large organizations are saddled with obsolete, "dusty-deck" information systems. But IS executives don't need Kinison to tell them to convert — they already know.

The problem is not a lack of desire. Rather, the real impediment is the enormous effort and risk inherent in development and conversion. Faced with the uncertainties of large-scale conversion, many organizations decide to stay with the devil they know for just a little while longer.

Unfortunately, as the years drag by, dependence on these outdated systems grows, making conversion even more difficult. Old systems become less and less maintainable. The inevitable result is that organizations get stuck with sluggish, outdated systems.

Eventually, these firms are passed over by organizations that have been better able to harness newer technology for competitive advantage.

The problems are real: Breaking up a system into subsystems for conversion can help shrink individual conversions, but it can also result in final products that are kludges. On the other hand, a massive onetime conversion — often needed for a seamless, integrated result — is tremendously risky.

But wait; all is not lost. It *is* possible to deliver both incremental benefits and integrated end results. IS executives can take decisive steps toward meeting the conflicting goals of "demassifying" conversion while delivering incremental, continuous benefits and producing an integrated end result. The key is to use a conversion methodology that uses an *architectural* approach to conversion.

This approach was successfully piloted at Citicorp's National Student Loan Business, which grew from $250 million to $2 billion in assets and substantially increased its customer satisfaction survey scores. All this at a time when conversion from older to newer systems was almost continuous.

It *is* possible to sweep out dusty old systems while your organization's business booms. The following are the four key themes to an architectural approach to conversion:

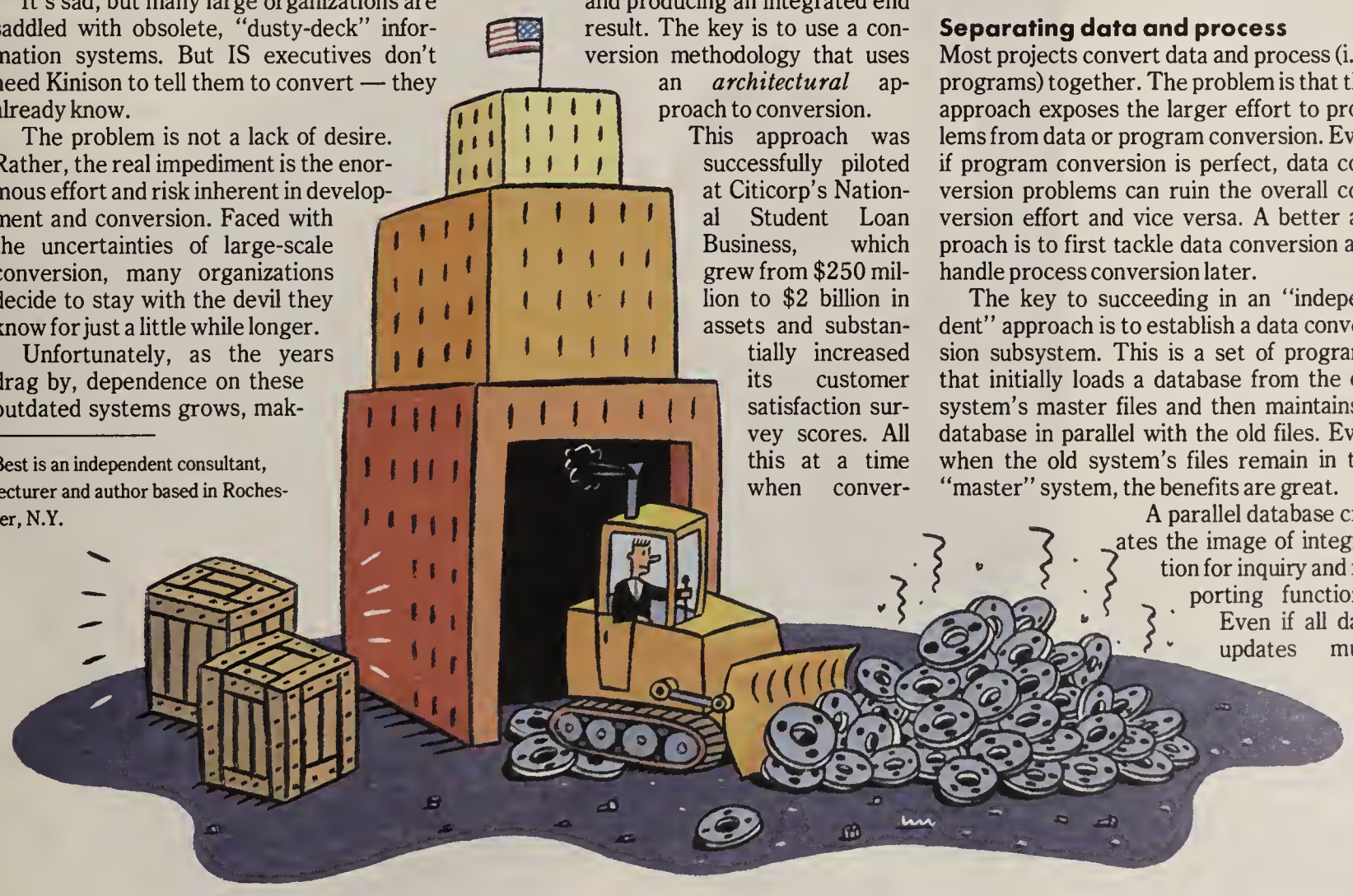
- Data and process do not need to be converted together.
- An underlying program architecture can be implemented before conversion of individual processing functions. This sets the stage for a completely integrated final result.
- In transaction processing, converting transaction entry and editing without updates gives most of the benefits that users see.
- Old and new systems can share a common, integrated database to allow the function of old systems to be extended before actually eliminating them.

Separating data and process

Most projects convert data and process (i.e., programs) together. The problem is that this approach exposes the larger effort to problems from data or program conversion. Even if program conversion is perfect, data conversion problems can ruin the overall conversion effort and vice versa. A better approach is to first tackle data conversion and handle process conversion later.

The key to succeeding in an "independent" approach is to establish a data conversion subsystem. This is a set of programs that initially loads a database from the old system's master files and then maintains a database in parallel with the old files. Even when the old system's files remain in the "master" system, the benefits are great.

A parallel database creates the image of integration for inquiry and reporting functions. Even if all data updates must



Michael Bartalos

Best is an independent consultant, lecturer and author based in Rochester, N.Y.

- **Four-step process aids conversion**
- **Convert without disrupting daily operations**
- **Old and new systems can share databases**

still be made through the old system, the organization can reap enormous strategic benefits from an integrated database for inquiry and reporting.

End users can use standard database facilities for ad hoc queries. The applications programming department can use the nonprocedural facilities of fourth-generation languages (4GL) to create advanced reporting subsystems. These same facilities, combined with the normalized data structures supported by modern database management systems, can allow for extremely powerful inquiry facilities.

Such facilities allow on-line users to gather all data needed to answer a question onto the screen at the same time, eliminating the need to jump from screen to screen. For example, this facility can greatly aid a customer service staff, which could then answer customer questions more quickly and effectively.

MOST benefits of modern on-line transaction processing can be achieved by front-ending the old system with an on-line transaction entry and validation system.

Architecture before detail

Older systems mix architectural logic with application-specific logic. This accounts for much of the difficulty in maintaining and extending these applications. A better approach is to separate generic application functions from application-specific functions. Doing so will dramatically improve maintainability and let IS add new application functions without affecting existing programs.

Most benefits of modern on-line transaction processing can be achieved by front-ending the old system with an on-line transaction entry and validation system. The operator uses the on-line facilities of the new architecture to enter new transactions, edit these transactions and re-edit transactions that failed a previous on- or off-line edit step. The application then formats transaction records and feeds them to the old system for updating. These updates are propagated to the parallel database via the conversion subsystem.

The major benefit of this approach is the increased productivity of on-line transaction processing. Most, if not all, of these benefits can be achieved without any changes to the logic of the old system.

Adding business functions does not necessarily require that old systems be modified. Introducing new functions with new application architecture offers another approach.

Old and new systems can both update the integrated database; each would do so by "owning" different portions. The old system would own the original converted elements, and the new system would own the new elements and new tables.

There are several benefits to this approach. Although the overall database is being updated by two separate systems, it still presents an integrated, enterprisewide view of organizational data. This allows the old system to coexist freely with the new for the purpose of inquiry and reporting.

It also allows new development, even development involving data update functions, to be made in the strategic new system environment rather than the "throwaway" old system. This helps preserve the value of the development investment and eliminates the need to support new processing functions with both the old and new systems. It also prevents strategic development from being stymied during the lengthy effort required to convert update functions from the old system.

Taking all these into consideration, the conversion project should be done in the following four phases:

Phase I: Database, inquiry and reporting conversion. The first step is to reverse-engineer the old system's master files to third-normal form, adding data structures needed to

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support an enterprisewide data model.

Once this data structure has been defined to the data dictionary, the next step is to create load and maintenance programs to establish the initial "mirror-image" database and to maintain it in parallel with the host master files.

In the best circumstances, the parallel database can be reloaded after every update of the old system. Usually, however, runtimes on a complete reload make this approach extremely impractical.

A more reasonable method is to compare the pre-update and post-update versions of the master files and trigger reconversion of only those accounts or items that actually changed.

Thus, completely reconverting these accounts or items is preferable to a mirror-image update because reconversion is simpler and helps guarantee synchronization between the master file and database.

The master file and database should periodically be reconciled, even daily, to ensure that the parallel database is not diverging from the master system's files. It may be necessary to create a comparison facility to track down differences on a record-by-record basis.

For the next step, open the new database to end-user computing using standard commercial packages. This procedure provides immediate benefits with essentially no effort on the part of applications programming staff.

After that, create an advanced on-line inquiry facility to fully use the new normalized data structures and database facilities. This facility is of particular value to customer service departments.

Finally, begin converting master-file reports to the database. This conversion can occur in parallel with all the remaining conversions and is less strategic than the inquiry conversion. This is because the process often merely replicates the reports the previous system was creating. (However, there is always opportunity to enhance the converted report to capitalize on the superior data availability of the modern database environment).

• **Phase II: Architecture, entry and editing conversion.** This phase helps organizational staff process organizational data.

The first step is to create an application architecture to support overall processing functions. This architecture should consist of an on-line superstructure, on-line transactional drivers, off-line transactional drivers and nontransactional drivers.

The database encompasses the following specialized tables supporting processing: transaction tables, extract tables, processing option tables and program-recovery tables. The application generation facilities of a 4GL often suffice for much of the on-line superstructure, although the remaining components now require development from scratch.

> A MORE reasonable method is to compare the pre-update and post-update versions of the master files and trigger reconversion of only those accounts or items that actually changed.

The next step is to use standard software engineering techniques, including computer-aided software engineering, to isolate logic needed to validate transactional functions. Priority should be given to the most strategic business functions. The source code of the old system can be of some benefit as a starting point. An analyst can isolate logic for a transaction by discarding all of the old system's overhead logic from the appropriate edit program. What is left is application policy for validating a particular business function.

Reworked validation logic is then plugged into standard slots in the architecture. It is often convenient to work the kinks out of the architecture by piloting a single transaction. After the pilot implementation is stable, remaining validation functions

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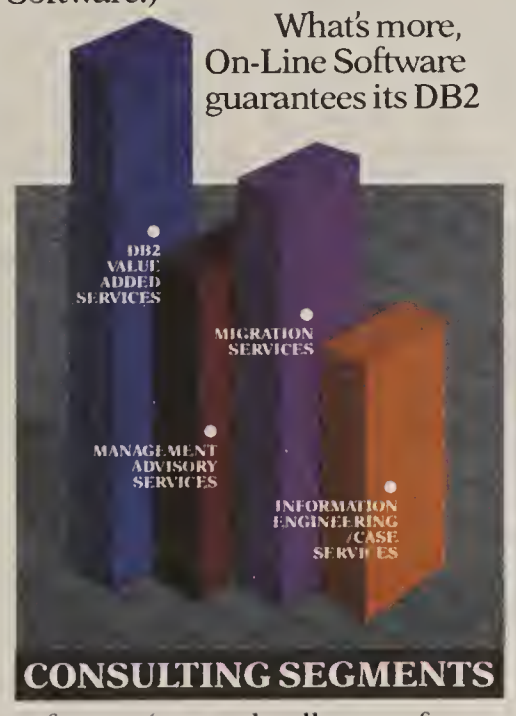

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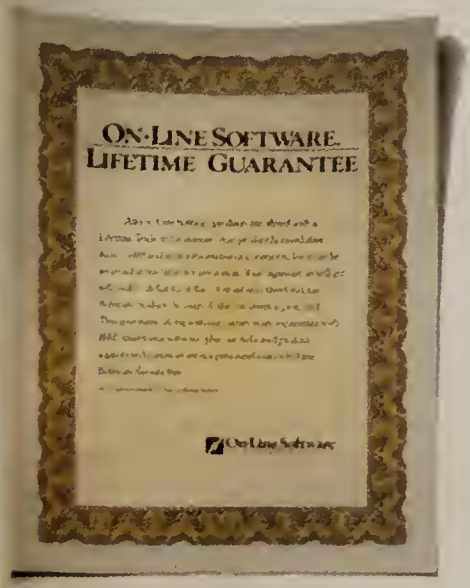

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are converted into one subsystem (for example, a department) at a time.

At the conclusion of this phase, all inquiry, all database reporting and most user-perceptible aspects of on-line transaction processing have been converted. The old system still remains the master system.

• **Phase III: Development of strategic new functions.** Once a database and application architecture have been implemented, it is important to start using them to competitive advantage — even if the old system has not yet been replaced.

Indeed, at this point the pressure to complete the final conversion will have abated somewhat because the organization will already be enjoying most of the benefits of on-line processing. This lull makes it easier to ensure that the final conversion of update functions is not rushed.

To further ensure that bread-and-butter processing is not disturbed by a rushed conversion, IS can delay the final conversion and address pressing strategic development issues.

Using the new database and architecture to support strategic development requires the addition or activation of new database elements and tables. Care must be taken to ensure that the conversion subsystem does not interfere with these new data structures.

Equal care is needed to ensure that the new system's logic does not interfere with data elements owned by the old system. These requirements limit new development to functions that are relatively independent of those supported by the old system. Many of the older systems have such enormous gaps in their support that this is sometimes not much of an impediment.

The processing logic components of new system functions are created by plugging edit and update modules into standard slots in the application architecture, developed during the on-line editing phase. This architecture is extended to encompass full-scale transactional and aging update functions.

• **Phase IV: Basic update conversion.** This phase is the final elimination of the old system by transferring its update logic into the new architecture to ensure maintainability. Data conversion issues are greatly reduced in this phase because most of the potential problems with the new data structure were dealt with in the inquiry and transaction editing phases.

However, IS may still need to perform one final data conversion upon implementation of update functions under the new system. As soon as this conversion is complete, data from the old system's master files are no longer brought over to the new system. Some organizations continue to run the old system in parallel for a time after switching update functions to the new system.

The old system's programs can be a good source for organizational update policy logic. The analyst isolates this logic by discarding overhead master-file access and editing logic. What remains is then fed into structured analysis.

The end result of the software engineering process is an update module that can be plugged into a standard slot in the application architecture. The architecture should not require modification to support this phase. All necessary architectural programming should have been completed by the end of the previous phase.

It is a good idea during Phase IV to try to preserve the overall business policy approaches supported by the old system. This reduces the complexity and increases the transparency of this conversion. If done properly, the Phase IV conversion can be invisible to users.

• **Phase V: Enhancement of converted functions.** The final phase exploits the potential of modern technology to rework — rather than merely replicate — functions of the prior application.

If basic application functions were structured properly during previous phases, this phase can be accomplished by combining and reshuffling business processing functions rather than by developing new transactions from scratch.

In any case, only the application-specific processing functions that sit on top of the overall application architecture and database should require changing. Eliminating the need to touch the architecture or the database makes the final conversion much easier than with traditional, one-step conversions.

Architecturally based conversion is not without risk, however. Much depends on having highly capable application and database architects who can see the project through to completion. These architects must have authority on any issue affecting the software environment so that they are empowered to ensure its overall integrity.

Trying this approach without adequate staff is inviting disaster. The risk comes from the complexity that arises with the interaction among the logic of the old system, the conversion subsystem, new update subsystems and converted update subsystems.

The major difference in staffing between traditional and architectural approaches to conversion is that the latter can require the services of an architect for a longer period of time.

At the same time, the architectural approach is much more likely to succeed than the traditional approach, and it delivers benefits much earlier in the development cycle.

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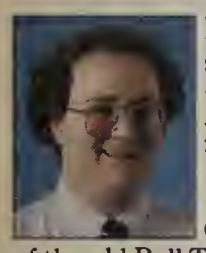
Bells don't toll for you



In the grand scheme of the universe, six years is a mere blink.

The various divested chunks of the old Bell Telephone System don't think so, though. From the day that U.S. District Judge Harold H. Greene broke them apart in early 1984, they've been champing at the bit to get into some of the areas heretofore denied to them — chiefly, information services. Meanwhile, a host of competitors ranging from other telecommunications carriers to newspapers are waving signs that say "Never!"

With congressional hearings under way that may result in loosening the Baby Bells' bonds a bit, the natural temptation is to choose sides. In this case, that's extremely difficult to do because none of these jokers is dealing from an entirely pure deck. And make no mistake — the hands aren't being dealt with your benefit in mind.

Let's take the Bells. Their lament is simple: "This is unfair restraint of trade, and it's been going on long enough." Clearly, it's killing them to have to sit inside, grounded like defiant chil-

Continued on page 108

Going with globalization thrust

CEOs expect foreign competition to be driving force in high-tech's future

ANALYSIS

BY MITCH BETTS
CW STAFF

Globalization will be more than just a buzzword in the 1990s. It will be the primary force that shapes the U.S. electronics and computer industries as companies increasingly look offshore for their competition, market opportunities and capital.

That was the sweeping conclusion of "Electronics 90: The New Competitive Priorities," a study released last week by the professional services firm Ernst & Young and *Electronic Business* magazine. The study was based on a survey of chief executive officers from 744 companies in the computer, software, communications, semiconductor and electronics sectors.

The survey found that more than 30% of the CEOs expect that foreign companies will be their top competitors by mid-decade, compared with only 13% today.

Software scare

Even in the software industry — long dominated by the U.S. — executives are concerned about emerging competition from the Far East. "To the extent that there will be offshore competition, I expect it to come from Japan," said Jon A. Shirley, outgoing president of Microsoft Corp., in an interview published in the study.

While almost all of the CEOs considered the U.S. to be their primary market, most executives said they believe that foreign markets will become increasingly important in the next five years, the survey stated.

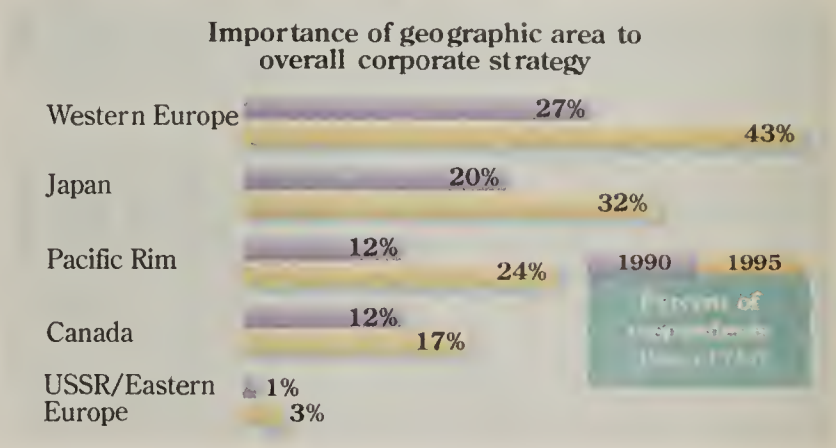
"Virtually every executive in this industry will need to understand the issues of international distribution and sales, strategic partnering with foreign companies, recruiting foreign personnel and managing currency rate exposure," said Stephen E. Almassy, national director of Ernst & Young's computer industry services.

The surveyed executives view Western Europe, Japan and the Pacific Rim as the key markets to exploit (see chart), but they are already finding foreign sales a challenging mission. While more than 60% of U.S.

Continued on page 108

Stretching out

Electronics industry CEOs have their five-year outlook sights fixed on Western Europe and Japan as the most promising areas for new business



Source: Ernst & Young

CW Chart: John York

Industry slump could spell user savings

ANALYSIS

BY MAURA J. HARRINGTON
CW STAFF

If there is any truth to the adage that seeing is believing, then a Gartner Group, Inc. report issued last week should make believers out of a lot of people who were not convinced that the computer industry is in a slump.

Aggregate fourth-quarter 1989 revenue growth for U.S. information industry vendors was down 5.7% compared with revenue growth in 1988, according to a study compiled by the Stamford, Conn.-based market research firm.

However, according to some analysts, the stalled fortunes of vendors could spell good fortune for users, who could enjoy at least the short-term advantage of heavy discounts on virtually everything, from software to microcomputers, minis and mainframes.

The numbers cited in the Gartner Group report painted a grim picture of a slowing industry (see chart page 108). In addition to sobering year-to-year margin and sales comparisons in all major sectors, software revenue growth in the fourth quarter of 1989 wound down to a single-digit percentage increase — 6.2% — for the first time "in at least a decade," said Randall Brophy, senior research analyst at Gartner Group.

Similarly, revenue growth in the recently booming microcomputer market "went single-digit for the first time since 1986 in fourth quarter '89," he said.

Conversely, coffers swelled in the niche markets in 1989, particularly among players such as Sun Microsystems, Inc., Tandem Computers, Inc., Stratus Computer, Inc., Oracle Systems Corp., Lotus Development Corp., Microsoft Corp. and Teradata Corp. Peripheral sales also grew, with Conner Peripherals and Quantum Corp. taking a large chunk of the market share with well-received new product entries, Brophy said.

Continued on page 108

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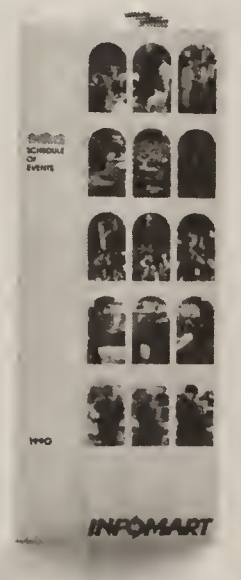

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IBM assails GSA 'foreign bias'

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — IBM has accused the U.S. General Services Administration (GSA) of "arbitrary, irrational and unlawful discrimination" for issuing a mainframe acquisition proposal that the firm says favors computers made in Japan and other foreign countries.

IBM's formal protest, filed March 8 with the GSA Board of Contract Appeals, said the offending procurement clause violates the spirit of the Buy American Act of 1933, which requires the government to give preference to U.S.-made goods.

A GSA spokesman declined comment on the case. Both sides will make their legal arguments at a Board of Contract Appeals hearing scheduled for April 6.

Matter of foreign components

The complaint concerns the GSA's 1991 mainframe schedule proposal, essentially an approved catalog for government purchases of mainframes. IBM said that some of its products, while manufactured in the U.S., cannot be certified as "domestic end products" under the current acquisition regulation because of the percentage of foreign components they contain. Unless changed, the contract regulation will classify some IBM products as foreign products subject to either 6% or 12% price surcharges on the GSA schedule, while products from Japan will be treated as domestic products, IBM said.

In essence, the IBM filing alleged that the GSA is using the wrong statutory test to determine what is a U.S.-made product. The GSA uses a provision in the Buy American Act that defines a product as domestic if the cost of its U.S.-made components exceeds 50% of the total cost.

IBM said the GSA should instead be using a test from the Trade Agreements Act of 1979, which focuses on whether the product has been "substantially transformed into a new and different article of commerce" in the U.S. IBM said the high dollar amount of the mainframe procurement requires the GSA to use the Trade Agreements Act test.

The Trade Agreements Act classifies Japan as a "designated country," the products of which are treated as though they were domestic. The irony, IBM said, is that the GSA is using the "substantially transformed" test for designated countries such as Japan but is using the tougher "50% component cost" test for defining domestic end products.

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IN BRIEF

You bring money, we'll bring the tech

Texas Instruments, Inc. and Japan-based **Kobe Steel Ltd.** are teaming up to make semiconductors — primarily based on CMOS technology — in Japan. Construction of a wafer fabrication plant in the Kansai region, estimated at $350 million and intended as home base for newly minted joint venture company **KTI Semiconductor Ltd.**, is scheduled to start in early 1991, with a late 1991 projected completion date. Under the agreement announced last week, Kobe will provide the lion's share of the start-up capital for KTI; TI will supply the manufacturing technology needed to create first the plant, then the chips.

Wizard deal

Electronic publishing player **Adobe Systems, Inc.** acquired its Mountain View, Calif., neighbor **Emerald City Software** last week; financial terms of the deal were not disclosed. Privately held, 3-year-old Emerald City makes typographic products and development tools based on Adobe's flagship product, the Postscript page-description language. All 15 employees of the start-up will join the Adobe roster.

Who's buying?

Not unexpectedly, software giant **Computer Associates International, Inc.** is. The Garden City, N.Y.-based firm plans to acquire Lisle, Ill.-based **DBMS, Inc.**, an 11-year-old mainframe and microcomputer-based software development and maintenance tool maker.

Dodgers lineup

Coral Gables, Fla.-based software vendor **Bloc Development Corp.** gained a new vice-president of technical development for its information management division last week. He's John P. Birch, who cut his technical teeth at IBM, directed advanced technology projects for ITT Corp. and from 1986 until now served as vice-president and chief technical officer at business software player McCormack & Dodge Corp., newly merged with Atlanta-based Management Science America, Inc. into Dun & Bradstreet subsidiary D&B Software.

Apple appeals for Air Force contract

BY JAMES DALY
CW STAFF

RESTON, Va. — A simple misunderstanding caused a General Accounting Office (GAO) recommendation that could negate an important contract to supply the U.S. Air Force with tens of thousands of Macintosh II personal computers, according to Apple Computer, Inc. officials.

Key technical abilities of an Apple operating system were not well understood by the congressional investigative office when it ruled that the Mac does not offer the multitasking abilities called for in the five-year contract [CW, Feb. 12], Apple Federal Systems Group Director Greg Shuk said.

The GAO erroneously believed that the Macintosh Operating System, which offers no multitasking capabilities, is required to run Macintosh applications, Shuk said.

The Air Force had originally asked bidders for computers that could perform at least 10 tasks simultaneously.

However, the applications specified in the contract will run under Apple's Unix derivative A/UX, which allows multitasking, Shuk said. "Mac OS has no place in the configuration we're offering," he added.

Based on its misperception, the GAO then recommended that bidding be reopened on the contract, which originally had been hailed as a breakthrough in Apple's struggle to win acceptance in the lucrative government market, Shuk said.

Under the contract awarded last August, Apple was to serve as a subcontractor under Honeywell Federal Systems, Inc. to supply at least 10,000 — and potentially as many as 80,000 — Macintoshes over several years, plus software and peripherals. Expectations of the potential value of the contract ran as high as $600 million. The GAO decided to reopen bidding following a protest by Martin Marietta Corp., a losing bidder.

Heavy duty

Although the GAO's recommendation is not binding, it carries considerable weight. "In the past five years, I can think of only one or two agencies that did not comply with our recommendations," said David Ashen, deputy assistant general counsel at the GAO.

However, Apple may have a big friend in the Air Force, which told the GAO that it would like to stick with the original Honeywell/Apple contract. Air Force officials said the cost of changing gears now could be as high as $25 million. They have also offered to pay Martin Marietta's bid and proposal fees.

Apple officials said the GAO has 30 days to respond to the request for reconsideration, which was filed March 2.

NTT breakup is postponed

TOKYO — Japan's Ministry of Posts and Telecommunications (MPT) has put off seeking legislation to separate the long-distance operation of Nippon Telegraph & Telephone Co. (NTT). Earlier this month, the MPT's advisory council recommended that NTT be split into three discrete companies [CW, March 19].

One contemplated step, however — the partitioning of NTT's long-distance operation into a new subsidiary — relies on a change in the law regulating NTT. MPT postponed seeking the legislative change until fiscal 1994. That decision would in turn delay the three-way breakup of NTT.

Breaking off the cellular phone operation, which does not use NTT's existing telephone lines, will occur sooner, probably at the end of fiscal 1991.

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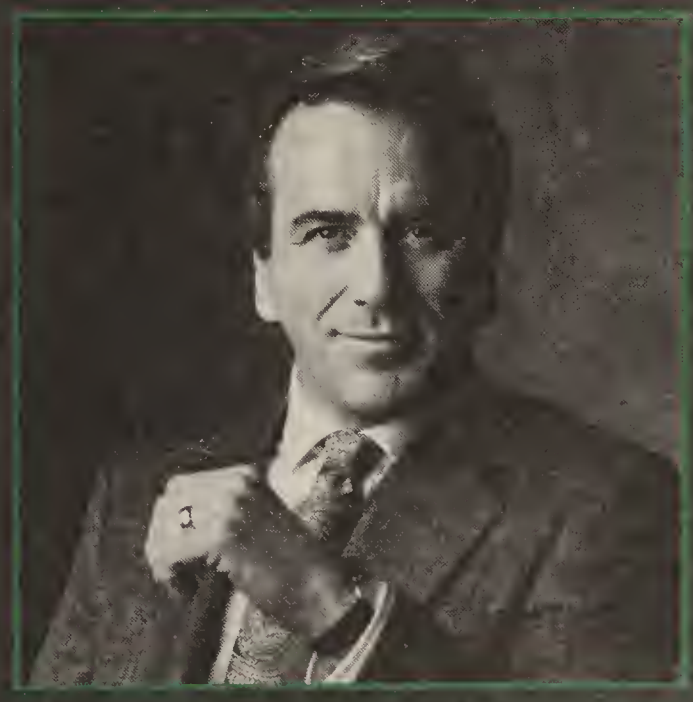

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Slump

CONTINUED FROM PAGE 105

"Those companies concentrating on niche markets such as fault tolerence, tape backup and other concentrated markets will continue to grow," Brophy added.

Mainframe and minicomputer 1989 net margins of 3.7% and 3.4% respectively marked an all-time low for both sectors, according to Brophy.

Part of the reason for an industrywide slump in margins for mainframes and minicomputers, Brophy said, was the heavy discounting that went on in 1989 — spurred, according to some analysts, by IBM's former marketing strategy, which resulted in favoring its major accounts with bigger discounts for some of IBM's bigger sales.

Strategy switch

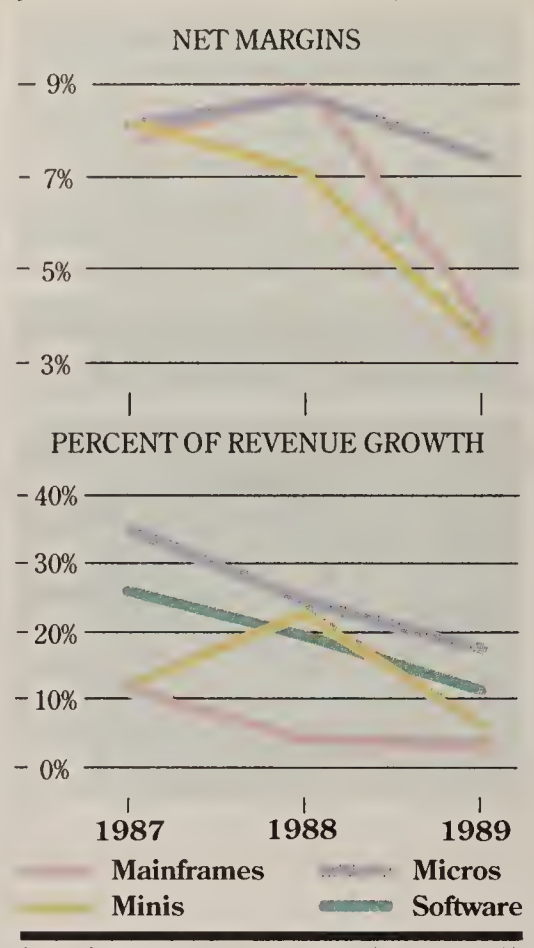
Those days are gone, however. IBM's new marketing strategy, put into effect in January, rewards sales managers for both revenue and gross profits generated rather than just revenue — a distinct disincentive to discount.

End users were also to blame for margin shrinkage last year, according to Bob Djurdjevic, president of Annex Research, a market research firm in Phoenix. Users who received, for example, a 40% discount on a full, multiyear package deal from IBM would turn to smaller mainframe vendors and demand more than 40% discounts for the mainframe alone, Djurdjevic said.

"[The new IBM marketing strategy] will force them to think and act more like businesspeople not just salespeople," Djurdjevic said.

Industry slouch

Net margins and revenues for the past three years illustrate the current industry slump



Source: Gartner Group, Inc. CW Chart: Doreen Dahle

Globalization

CONTINUED FROM PAGE 105

electronics firms have sought to establish sales in Japan, nearly one-third have failed, according to the survey.

Not surprisingly, 50% of the CEOs believed that their success or failure in the Japanese market depends on the U.S. government's ability to negotiate a favorable trade agreement with Japan, the study said.

James G. Treybig, president and CEO of Tandem Computers, Inc., is looking at the prospect of a unified German market. "If the West Germans go into East Germany, then I think that will be a good market — about a 20% bigger market than West Germany alone," he said in the study.

G. Steven Burrill, national director of Ernst & Young's high-technology industry services, said the survey "demonstrates unequivocally that corporate leaders in high technology no longer think in terms of domestic markets or domestic technology developments."

U.S. industry will increasingly look upon foreign countries as sources of capital, the study added. Today, 16% of the industry relies on foreign funds; that is expected to increase to 27% over the next five years, it said.

Meanwhile, the industry seems to have a love/hate relationship with Wall Street. The CEOs said they expect to increasingly tap the public equity markets as their primary source of capital, but 76% complained that Wall Street's short-term, quarterly perspective is holding back the industry's long-term growth.

In the study, Ashton-Tate Corp. Chairman and CEO Edward M. Esber Jr. called the quarterly reporting requirements "a very frustrating scenario" for the software business. "In the end, it's the investor and the customer who suffer when companies decide not to invest in upgrading a popular product or developing a new, advanced technology because of the effects on the short-term revenue stream," he said.

High-tech trends

In addition to globalization, the study identified the following trends for the high-tech industries during the 1990s:

- Seventy percent of the CEOs named customer service as a top area of focus for their companies in the coming five years.
- More than 86% of the industry CEOs expect strategic alliances to play an "extremely important" role in their companies' business strategies over the next five years.
- Half of the CEOs expect their own companies to be acquired or merged in the next five years.
- No consensus developed about what role the U.S. government should play in boosting the competitiveness of high-tech industries.
- The possibility of a recession is by far the most serious economic concern of all electronics companies. The second biggest economic issue was the federal budget deficit.

St. John

CONTINUED FROM PAGE 105

dren while everybody else is having a great time outside playing.

Well, I bleed for the Bells. The various holding and operating companies were part of a structure that, for nearly a century, was *the* monolith of U.S. business, enjoying a lack of competition that other companies would have killed for. One of their main arguments is that the market is hampered by their inability to release cutting-edge technologies or information that would increase users' efficiency.

To some extent, they've got a beef there; witness the way the Federal Communications Commission put Southwestern Bell on hold while waiting for permission to give listings to AT&T for a national on-line directory. And that's small potatoes compared with the effect the Bells' pent-up energy could have on the entire market.

Right now, there's legislation pending that would let up on the Bells a bit but still bar them from information services. Indications are that they think it's not enough; an even more lenient measure is being drafted that would take the bonds off totally. The result will probably be that neither passes, and for the moment that may be best; opponents say the rest of the market would suffer in the long term from the Bells' strong presence, and they may well be right.

Does all this mean the opposition is any more correct? I'd say not. Opposition from long-distance carriers — including, ironically, AT&T — is only to be expected, given their desire to keep the Baby Bells off their necks for as long as possible. That's sound business; what it isn't is an altruistic motive for restraining business for the good of the people, the country, or anyone other than AT&T, MCI, Sprint and the rest of the competitive carriers.

Even more laughable is the opposition from newspaper publishers, who claim they'll never be able to get a foothold in the information services market in the face of a market assault by the Bells. All that means is that the empire-building of the chains — the only ones who could afford to enter the market — will be slowed somewhat. I doubt any of them are going to have too much of a struggle jumping into information services, unless they run their shows the way Knight-Ridder ran its ill-fated Viewdata project a few years back.

So why *are* these hearings being held? Well, some honorable members of our Congress think it's time some wrongs were righted. Rep. John Dingell (D-Mich.) says Congress and the FCC ought to have oversight of the market instead of Greene. This, folks, is a turf battle, plain and simple. In fact, what we have here is self-interest all around. Until any one of these parties can explain what's in it for users, perhaps we should turn a deaf ear to all of them.

St. John is *Computerworld*'s chief copy editor.

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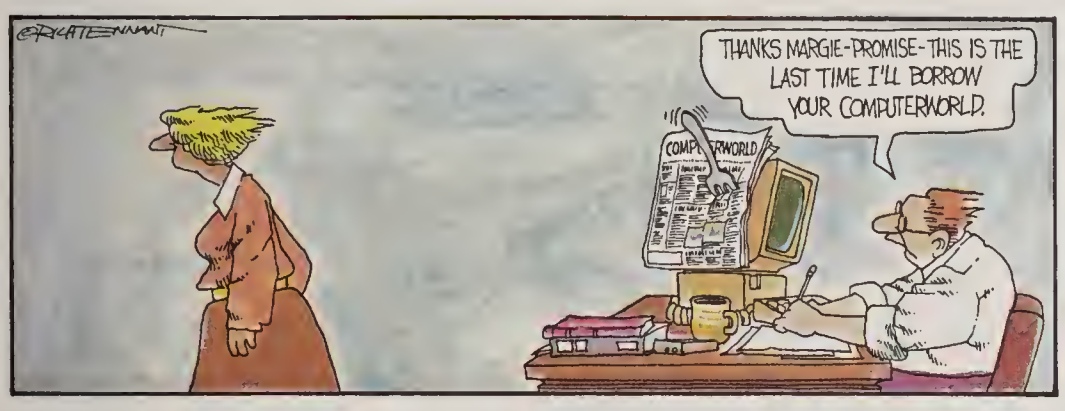

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Two cheers for Hollywood

In movie making, IS people experience more pressure than glamour

BY DAVID A. LUDLUM
CW STAFF

Information systems professionals in the movie industry can't expect to do power lunches with Stephen Spielberg or dine with Meryl Streep. John Granaghan, vice-president of MIS at Orion Pictures Corp., says he sees more famous people on the streets of New York than on the job.

Even if they don't join in the glamour, however, IS people get their share of pressure, according to executives and consultants. The pace is frenetic because the business is driven by deals — deals for individual projects and, given the stiff competition and high financial stakes, deals for new top management.

These deals are often negotiated in secret, then suddenly announced to the world. Furthermore, a movie deal doesn't bring even short-term stability; performers and other "creative" professionals prompt frequent changes in projects, sometimes even cancelling them.

New management usually means a new strategy and structure — things that can also change quickly without a new face at the top. Two years ago, for example, studios could barely supply enough programming for syndicated television. Now the demand has dried up. The catchphrase is "What have you done for me lately?" says Jerry Mayfield, a vice-president at DMW Group, an IS consulting firm in Stamford, Conn.

Given the pace, lead times for getting systems up and running can be much shorter in the movie industry than in other industries, and "crunch mode" is another common expression, says an IS executive at a major studio in Los Angeles.

As a result, systems analysts need to know business needs thoroughly, executives say. Since analysts may do analyses while colleagues design, IS people also need a collaborative spirit and strong communication skills.

Communication with users can pose special demands as well. IS people are often careful, deliberate and detail-oriented, while movie industry users tend to be more spontaneous, "almost like the yuppie crew on Wall Street," Mayfield says.

Love IS or hate IS

The users tend to be enthusiastic about technology; it plays a leading role in some productions. But personality conflicts can lead users into a love-hate relationship with IS organizations, Mayfield says. "They want the technology, but you've got to be able to deal with them on their terms."

IS people won't join the stars in inking megabuck contracts, but they do get compensated for working in a high-pressure environment. It's not unusual for systems analysts to make more than $60,000 per year and for programmers to bring in more than $40,000, consultants and executives say.

The industry offers growth potential, too. There were record sales of movie tickets last year, and studios are generating additional revenue through videocassettes, television and international distribution.

Development of new systems should be a particularly strong growth area as companies launch new ventures. At one company, the home video business has grown from zero to $650 million in five years, says Victor Janulaitis, chief executive of Positive Support Review, Inc., a Los Angeles consulting firm. That growth required the development of systems for jobs such as tracking orders, controlling inventory and forecasting demand.

Today, most companies are exploring the studio tour business, and in the future, many of them will put films on laser disc, creating the need for new procurement and distribution systems, Janulaitis says. Some of these systems will employ electronic data interchange, he adds.

Like other industries, the movie business needs programmers, but these people tend to be readily available. Companies have a more difficult time finding analysts and project managers who have movie industry experience.

Another big need is for specialists in personal computers and local-area networks, which movie companies use at production sites. There, workers use PCs to track spending and working hours, monitor budgets and run payrolls for day workers. Others also use the technology; animators and music composers do some of their work on PCs, and writers use them to revise scripts while a movie is being shot.

The movie industry's strong project orientation makes consultants popular; studios often need IS people when they begin production of a new film, TV show or commercial.

Movie companies also need people who understand finance, executives say. They value IS professionals with some academic training in this area, previous work at a major accounting firm or some experience at solving complex financial problems, according to John Sanders, vice-president of MIS at MGM/UA Communications Co. in Culver City, Calif.

Movie companies must monitor budgets closely and run complex financial applications unique to the industry. One application is tracking residual payments for the re-release of movies and television reruns, seeing that the right people get paid the proper amounts. Another is tracking ticket receipts: Movie companies collect a percentage of ticket prices on a sliding scale that changes as movies continue to run.

If an IS person can't maintain control of this kind of application, top managers will tell him they can't afford to keep him around, Janulaitis says: "There's too much money at risk."

TODAY, MOST COMPANIES are exploring the studio tour business, and in the future, many of them will put films on laser disc, creating the need for new procurement and distribution systems.

Ludlum is a *Computerworld* senior writer.

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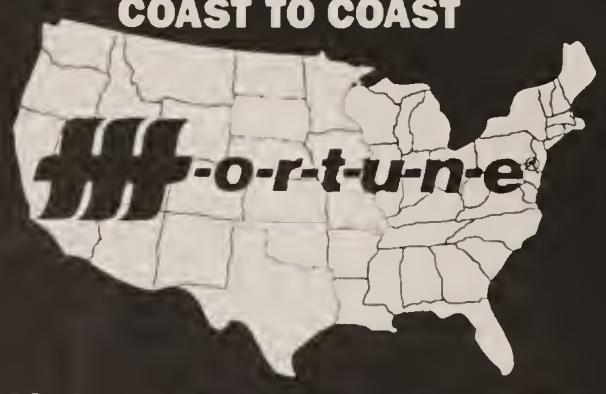

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Positions require 4+ years of structured coding experience. Highly desired experience would include COBOL, CICS, DB2 and DATACOM. A four-year degree is preferred.

Systems Analysts

Positions require 4+ years experience in a development environment versus a maintenance environment. Highly desired experience would include structured design techniques, data modeling experience, prototyping and Method/1 knowledge. A four-year degree is preferred.

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Position requires 4+ years experience in data administration, database administration, or systems development. At least 1-2 years experience in logical or conceptual data modeling is also required, as well as experience with CASE tools. Excellent interpersonal and communication skills are essential, and JAD facilitation skills are highly desirable. Some task or project management experience is also desirable. A four-year degree is preferred.

DATABASE ANALYST

Position requires 4+ years experience utilizing a relational database engine, preferably DB2 or DATACOM/DB. Desirable experience includes formal participation in the physical DB design activity of development projects. A four-year degree is preferred.

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Position requires 5+ years experience in data communications in a large systems SNA environment. Knowledge of PC Local Area Networks desirable. Excellent written and oral presentation skills, as well as project management and planning experience, are a must. A four-year degree is preferred.

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Requires 3-5 years of technical experience in personal computer support, including a minimum of 1-2 years in the design, implementation and support of Local Area Networks, preferably in a LAN-to-LAN or wide-area connectivity environment. Banyan network operating system experience strongly desired. Candidates must possess strong verbal and written communication and client consulting skills. A four-year degree is preferred.

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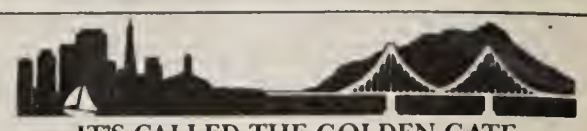

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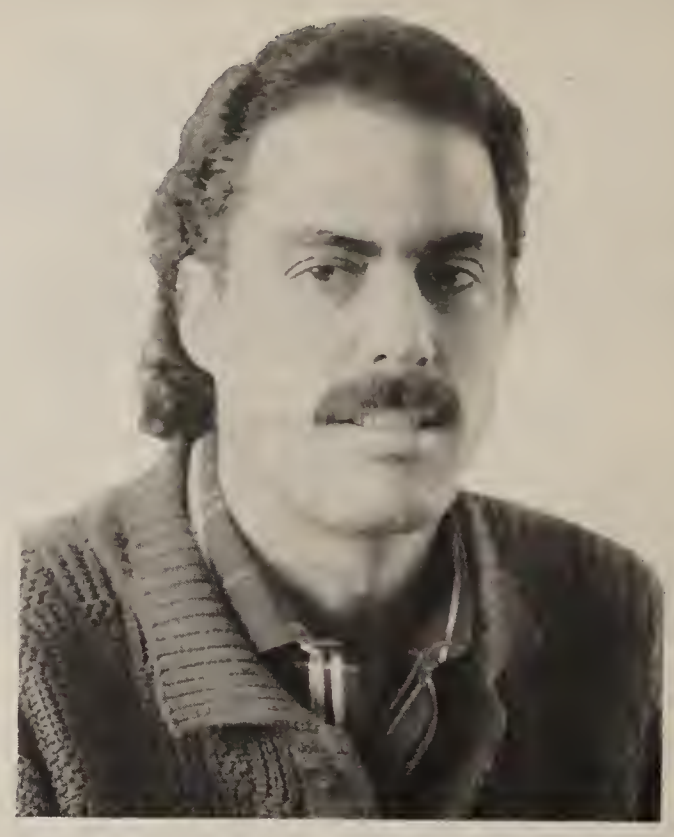

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Leasing in the '90s: A new look

Business strategies and technological change are factors in the decision

BY MICHAEL ERBSCHLOE
SPECIAL TO CW

If you are deciding whether to lease or buy computer systems, there is more to think about than the traditional financial trade-offs. In today's business environment, you need to consider the long-range plans of your business unit or venture. You also need to take into account the pace of technological advances. Both of these concerns may be more important than the components of conventional financial analysis.

Companies that did well in the 1980s were creative, intelligent and market-oriented. The ones that will do well in the 1990s will be fast, flexible and flush with cash or ready credit to take advantage of market opportunities. Leasing computer systems can help keep a business lean, with less money invested and more cash available.

Leasing can also enhance the flexibility that companies will need to respond to the quickening pace of technological change.

Leasing computer equipment can still provide the following traditional benefits:

- Prevent you from getting stuck with obsolete equipment.
- Free up capital for other uses.
- Improve your cash position by spreading costs over a period of years.
- Stabilize earnings and net worth by minimizing peaks and valleys in income caused by large capital expenditures.
- Reduce the potential for losses when replacing equipment that has not been fully depreciated.
- Allow custom-tailoring of contract terms, such as the timing and amount of payments and conditions for buying or subleasing equipment.

With the business environment becoming more competitive, there can be other benefits. Leasing can help minimize investments in business units that might be sold or spun off, increasing the potential profit of such moves.

Leasing can also reduce the number of managers and staff members needed to acquire or dispose of equipment. This concern is becoming more important as companies try to hold staff levels to a minimum. It is especially relevant when an organization's capital spending procedures require involved cost justification or other time-consuming measures.

The pace of technological change also influences the decision to lease or buy in several ways. New technology is coming to market every 12 to 18 months, which is devastating the residual value of installed equipment. By keeping the value of computers off the balance sheet, leasing can help reduce the impact of plunging residual values. This is particularly true with technologies undergoing rapid advancement, such as workstations and high-end servers.

The shortened product cycles also make it more difficult to sell used equipment, which suffers from increasingly poor price/performance levels. Leasing can eliminate the need to face this challenge.

Finally, leasing can make it easier to test new technology or systems from vendors with which you don't presently do business. You might want to conduct such tests in an individual business unit or on a particular application without disrupting your mainstream operations. This tactic is becoming more important and more prudent to assure that your company does not get stuck with a platform that is antiquated or discontinued.

Although these factors are making leasing more attractive for some companies, there are still many situations in which it is not the best alternative.

Leasing may not be desirable if your company can benefit from the depreciation allowed on purchased equipment.

Leasing will not be the least expensive alternative if the equipment you are acquiring will be an integral part of your major architecture and if you will be using it over a long period of time. By leasing for five years or more — a typical life span for a large mainframe — you will end up paying more than you would by purchasing a system.

If a lease will in any way diminish the control that you need to maintain — restricting where you can move a system, for example — purchasing is your best alternative.

If a lessor requires you to buy maintenance services that are not consistent with your maintenance strategy, it may cost you more to lease than to buy.

In most companies, the roles that information systems managers play have expanded well beyond that of technologist. More companies expect IS managers to participate in business planning and decision-making. Other companies want IS managers to at least possess a better understanding of the impact of computer acquisitions on the organization's financial health and flexibility.

> LEASING CAN HELP minimize investments in business units that might be sold or spun off.

A sharp IS manager can turn the difficulties that arise in acquiring and disposing of systems to his advantage. If he can show his firm how to meet its computing needs and minimize current and long-term costs, he may find his bosses very appreciative.

Erbschloe is executive editor at Computer Economics, Inc. in Carlsbad, Calif.

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The BoCoEx index on used computers

Closing prices report for the week ending March 9, 1990

	Closing price	Recent high	Recent low
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XT Model 086	$600	$825	$600
XT Model 089	$675	$800	$600
AT Model 099	$1,050	$1,600	$1,000
AT Model 239	$1,350	$1,700	$1,200
AT Model 339	$1,500	$1,800	$1,500
PS/2 Model 50	$1,850	$2,200	$1,700
PS/2 Model 60	$2,425	$2,600	$2,400
Compaq Portable II	$1,700	$1,725	$1,550
Portable III	$2,400	$2,500	$1,900
Portable 286	$1,900	$2,000	$1,700
Plus	$750	$950	$675
Deskpro	$900	$1,200	$800
Deskpro 286	$1,525	$1,825	$1,300
Deskpro 386/16	$2,500	$2,750	$2,475
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JAD sessions: Setting the tone

Training managers are the lead players in Joint Application Design

BY MARK DUNCAN
SPECIAL TO CW

Joint is the operative word in joint application design, or JAD, which supports the trend in recent years toward pulling together the parties responsible for designing application software.

The information systems manager faced with delivering training for the introduction of JAD must understand the roles and responsibilities of the participants as well as the mechanics of the JAD session.

When an organization first embarks on JAD, it would do well to arrange professional training for the participants, especially for the facilitator. Many companies already offer such training.

When JAD becomes an accepted technique and facilitators get some experience under their belts, they may take on the responsibility for grooming new participants. The training manager's first job will be identifying prospective participants, which calls for knowing what to do. The major players are the following:

The facilitator. JAD participants come from different parts of the organization and hold different ranks, but within the JAD session, everyone is considered equal. It is up to the facilitator to maintain an atmosphere free of hostility or intimidation.

Good candidates for the role of facilitator must be able to lead people who are from different parts of the organization and of mixed rank. They must control a meeting, keeping it on track while permitting legitimate digressions. They must draw everyone into the session and be persistent in working toward consensus.

The executive sponsor. Though they play a minimal role in terms of attendance, executive sponsors are crucial in providing support and commitment. The training manager must make them aware that it is their responsibility to create and sustain the momentum of JAD. Their appearance at kickoff sessions is essential to charge the team with a purpose and to motivate it with encouragement and respect.

The user. Users fortunate enough to work in a progressive IS department will probably have little difficulty adapting to JAD, since they already serve as key players in system development. JAD will simply be a logical, formal extension to existing practices. Users who've been excluded from heavy participation may require more encouragement.

The system developers. Similarly, some system developers may find it hard to accept users and other people as equal participants in development. The following statistic can provide one selling point for trainers: The largest percentage of software errors, and the ones most difficult to correct, arise in the early phases of requirements and design. Developers should see that user participation means sharing the responsibility for accuracy in requirements — and more than likely a reduction in these errors.

The scribe. This is typically a technical person from the development staff. The scribe must, however, be familiar enough with user terminology to capture and represent a requirement or design feature on the tool being used in the JAD session.

Specialists. Specialists attend JAD sessions on demand. Their role is to provide expert information on aspects of the business or the means of automating functions.

The rules governing the JAD session are simple and straightforward. At first, the facilitator must enforce them fairly and consistently. After participants become familiar with JAD, they might take on more of this role.

The key rules and procedures the trainer must convey to the participants are:

- Every participant participates! Occasionally, nonparticipating observers will be present, but otherwise, there are no passengers in a JAD session.
- Participation is full-time. Poor or sporadic attendance will weaken JAD; a group of people working closely together toward a common goal generate momentum and synergy.
- One speaker at a time. The facilitator must guard against side conversations in which some participants exchange comments to the exclusion of others.
- No interruptions. If necessary, the facilitator may limit a speaker who appears intent on consuming an unfair amount of time to make a point or has digressed far from the issue.
- The facilitator controls the agenda. He keeps the session on track; though the agenda may have been created jointly, it is one of the facilitator's jobs to ensure that it is honored.
- Reach a consensus. On those occasions when a consensus proves elusive, the facilitator may pursue one of several alternatives. He may request that specialists attend the session or request a subsequent session when participants return with fresh energy and ideas.
- Sessions are user-driven. The most important purpose of JAD is to identify and capture complete and accurate user requirements. It is the users, therefore, who should do most of the talking by stating facts and describing business functions. The IS people should ask the appropriate questions to solidify those facts and functions.

Duncan is a quality assurance consultant at a large Dallas bank.

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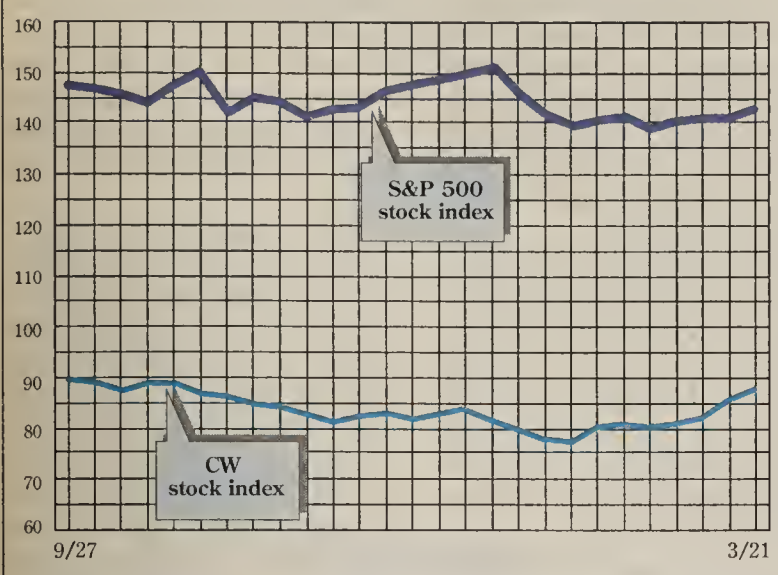
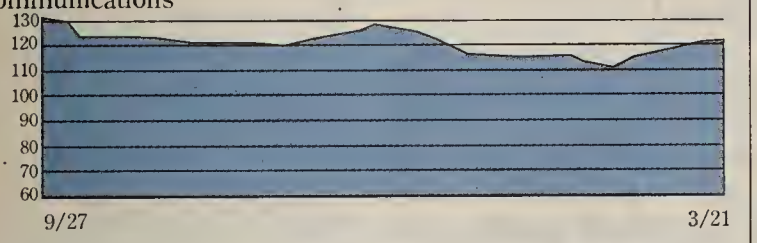
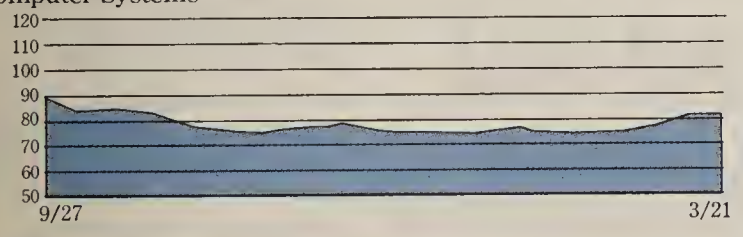


Indexes	*Last Week*	*This Week*
Communications	120.7	**122.6**
Computer Systems	81.9	**81.8**
Software & DP Services	120.8	**125.9**
Semiconductors	56.9	**59.1**
Peripherals & Subsystems	80.5	**81.6**
Leasing Companies	95.8	**96.3**
Composite Index	86.7	**88.4**
S&P 500 Index	142.2	**143.4**

Communications



Computer Systems



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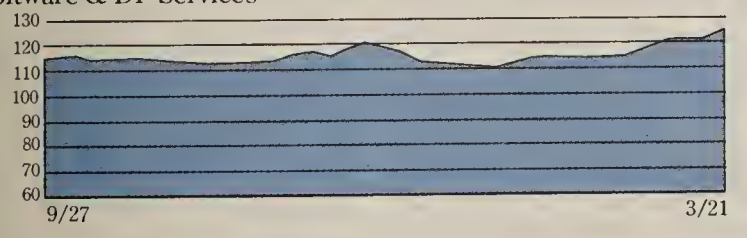
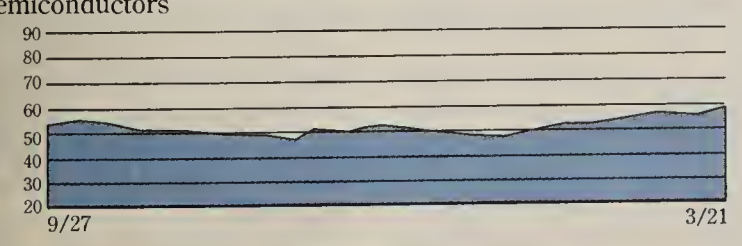
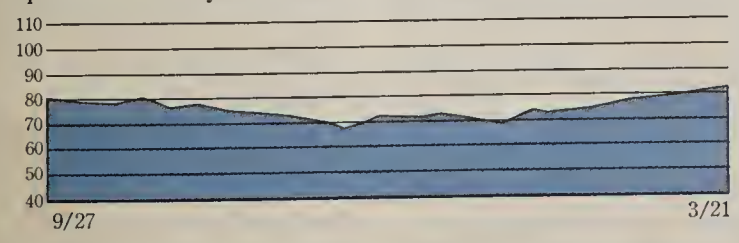


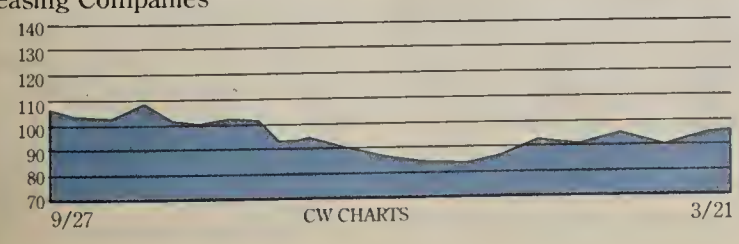
Semiconductors



Peripherals & Subsystems



Leasing Companies



CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MARCH 21, 1990

EXCH		52-WEEK RANGE		CLOSE MARCH 21, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
	Communications and Network Services					
N	AMERICAN INFO TECHS CORP	68	50	60.25	0.4	0.6
Q	ANDREW CORP	26	18	23.75	1.8	8.0
Q	ARTEL COMM CORP	9	3	8.5	1.0	13.3
N	AT&T	47	30	41.875	0.9	2.1
Q	AVANTEK INC	7	2	3.313	-0.1	-1.8
N	AYDIN CORP	21	14	15.125	0.3	1.7
N	BELL ATLANTIC CORP	114	75	90.625	0.0	0.0
N	BELLSOUTH CORP	59	41	53.875	1.0	1.9
Q	COMPRESSION LABS INC	14	4	14	0.6	4.7
Q	CONTEL CORP	37	25	27.625	-1.4	-4.7
Q	DATA SWITCH CORP	6	2	2.25	0.4	20.0
Q	DIGITAL COMM ASSOC	25	17	20.375	0.6	3.2
Q	DYNATECH CORP	21	16	15.5	-0.3	-1.6
Q	FIBRONICS INTNL INC	8	4	7.375	-0.4	-4.8
Q	GANDALF TECHNOLOGIES	7	3	2.625	0.0	0.0
N	GENERAL DATACOMM INDS	7	4	4.125	0.3	6.5
N	GTE CORP	72	45	62.75	0.9	1.4
Q	INFOTRON SYS CORP	13	6	6.25	0.0	0.0
N	ITT CORP	65	51	52.5	-1.8	-3.2
N	M A COM INC	9	4	4.25	-0.1	-2.9
Q	MCI COMMUNICATIONS CORP	49	26	34.625	0.5	1.5
N	NETWORK EQUIP TECH INC	34	19	33	0.0	0.0
Q	NETWORK SYS CORP	13	7	11.75	0.0	0.0
N	NORTHERN TELECOM LTD	26	14	25.625	0.1	0.5
Q	NOVELL INC	45	24	42.375	-0.9	-2.0
N	NYNEX CORP	92	69	81	0.6	0.8
N	PACIFIC TELESIS GROUP	52	34	45.625	1.6	3.7
A	PENRIL CORP	9	4	6.875	0.4	5.8
N	SCIENTIFIC ATLANTA INC	25	14	22.875	-0.6	-2.7
N	SOUTHWESTERN BELL CORP	65	44	55	-0.5	-0.9
Q	3 COM CORP	29	10	13.875	0.4	2.8
N	U S WEST INC	81	61	72.625	1.6	2.3
	Computer Systems					
Q	ALLIANT COMPUTER SYS	8	3	7	-0.1	-1.8
Q	ALPHA MICROSYSTEMS	8	4	4.25	0.6	15.2
Q	ALTOS COMPUTER SYS	8	5	5.625	0.1	2.3
A	AMDAHL CORP	23	11	14.625	0.1	0.9
Q	APPLE COMPUTER INC	50	32	41.625	4.9	13.3
N	BOLT BERANEK & NEWMAN	10	5	6.5	0.4	6.1
N	COMPAQ COMPUTER CORP	113	67	100.25	3.9	4.0
N	COMMODORE INTNL	20	7	8.625	0.1	1.5
N	CONTROL DATA CORP	24	16	18.5	-0.5	-2.6
N	CRAY RESH INC	58	31	47.125	1.0	2.2
Q	DAISY SYS CORP	5	0	0.5	-0.1	-15.8
N	DATA GEN CORP	19	8	9.125	-0.3	-2.7
N	DATAPOINT CORP	6	2	2.5	-1.1	-31.0
Q	DELL COMPUTER CORP	9	5	7.75	0.8	10.7
N	DIGITAL EQUIP CORP	103	70	80.875	3.5	4.5
N	FLOATING POINT SYS INC	4	1	1.5	0.0	0.0
N	HARRIS CORP	40	28	33.25	1.6	5.1
N	HEWLETT PACKARD CO	58	40	46.5	2.5	5.7
N	HONEYWELL INC	92	63	89	2.1	2.4
N	IBM	119	93	107.25	1.0	0.9
Q	INFORMATION INTL INC	16	12	12.75	0.0	0.0
Q	IPL SYS INC	10	5	9.75	-0.3	-2.5
N	MAI BASIC FOUR INC	9	2	2.875	0.1	4.5
N	MATSUSHITA ELEC INDL LTD	186	123	123	-8.3	-6.3
Q	MENTOR GRAPHICS CORP	22	14	18.5	1.6	9.6
N	NBI INC	3	0	0.281	-0.1	-18.3
N	NCR CORP	72	53	69.25	0.6	0.9
Q	PYRAMID TECHNOLOGY	30	9	29.75	1.3	4.4
Q	SEQUENT COMP SYS INC	28	10	25	0.8	3.1
Q	SHARE BASE CORP	3	0	0.469	-0.1	-16.7
Q	SUN MICROSYSTEM INC	25	13	24.875	1.4	5.9
Q	SYMBOLICS INC	2	1	0.75	-0.1	-14.3
N	TANDEM COMPUTERS INC	30	15	29.125	1.1	4.0
N	TANDY CORP	49	32	35.75	1.9	5.5
N	ULTIMATE CORP	12	6	6.875	0.6	10.0
N	UNISYS CORP	28	12	15.375	-1.3	-7.5
A	WANG LABS INC	9	4	5.5	-0.3	-4.3
	Software & DP Services					
Q	AMERICAN MGMT SYS INC	17	11	12.5	-0.3	-2.0
Q	AMERICAN SOFTWARE INC	23	13	23	0.8	3.4
N	ANACOMP INC	8	3	3.25	-0.4	-10.3
Q	ANALYSTS INTL CORP	20	12	15.75	-1.3	-7.4
Q	ASHTON TATE	24	9	13.75	1.0	7.8
Q	ASK COMPUTER SYS INC	16	7	9.125	-0.4	-3.9
N	AUTO DATA PROCESSING	54	36	53.625	2.1	4.1
Q	AUTODESK INC	50	27	47.75	1.3	2.7
Q	BMC SOFTWARE INC	26	10	23.75	0.1	0.5
N	BUSINESSLAND INC	14	7	11	0.4	3.5
Q	COGNOS INC	8	4	5.875	1.4	30.5
N	COMPUTER ASSOC INTL INC	22	11	14.625	0.4	2.6
Q	COMPUTER HORIZONS CORP	11	7	8.875	0.1	1.4
N	COMPUTER SCIENCES CORP	59	44	47.625	1.6	3.5
N	COMPUTER TASK GROUP INC	16	9	11.5	0.0	0.0
Q	COMSHARE INC	44	25	43.5	5.0	13.0
Q	CORPORATE SOFTWARE	16	8	12.625	1.9	17.4
N	GENERAL MTRS (CLS E)	31	21	30.5	2.3	8.0
Q	HOGAN SYS INC	7	4	4.375	0.6	16.7
Q	INFORMIX CORP	17	8	14.625	1.0	7.3
Q	INTELLICORP INC	7	3	6	-0.1	-2.0
Q	LEGENT CORP	32	21	29.25	-1.0	-3.3
Q	LOTUS DEV CORP	38	19	35.75	2.8	8.3
Q	MICROSOFT CORP	117	48	113.25	6.0	5.6
Q	NATIONAL DATA CORP	35	26	31.5	0.8	2.4
N	ON LINE SOFTWARE INTL INC	11	6	9.5	1.0	11.8
Q	ORACLE SYS CORP	28	11	26.25	0.6	2.4
N	PANSOPHIC SYS INC	19	12	17.375	0.5	3.0
Q	PHOENIX TECHNOLOGIES INC	18	2	3.125	0.5	19.0
Q	POLICY MGMT SYS CORP	38	22	35.25	1.5	4.4
Q	PROGRAMMING & SYS INC	22	16	18	0.0	0.0
Q	RELATIONAL TECH INC	15	5	8.875	0.1	1.4
N	REYNOLDS & REYNOLDS CO	34	19	20	-0.5	-2.4
Q	SAGE SOFTWARE INC	13	7	12.75	0.0	0.0
Q	SEI CORP	20	15	19	0.8	4.1
Q	SHARED MED SYS CORP	19	12	13.625	0.3	1.9
Q	SOFTWARE PUBG CORP	25	11	23.25	2.4	11.4
A	STERLING SOFTWARE INC	10	5	10	0.8	8.1
Q	SUNGARD DATA SYS INC	26	13	19.25	-0.5	-2.5
Q	SYSTEMATICS INC	41	30	40.75	2.1	5.5
N	SYSTEM CENTER INC	26	18	24.375	1.9	8.3
N	SYS. SOFT INC	28	12	27.5	1.3	4.8
Q	WORDSTAR	3	1	0.75	0.0	0.0
	Semiconductors					
N	ADV MICRO DEVICES INC	11	7	9.5	0.4	4.1
N	ANALOG DEVICES INC	12	7	8.25	0.3	3.1
Q	ANALOGIC CORP	11	9	9.375	0.1	1.4
Q	CHIPS & TECHNOLOGIES INC	26	14	21	0.0	0.0
Q	INTEL CORP	44	23	42.375	3.1	8.0
Q	MICRON TECHNOLOGY INC	26	7	12.5	-0.1	-1.0
N	MOTOROLA INC	70	40	68.125	2.9	4.4
N	NATL SEMICONDUCTOR	9	5	8.125	0.6	8.3
N	TEXAS INSTRS INC	47	28	37	1.1	3.1
A	WESTERN DIGITAL CORP	15	6	12.75	1.1	9.7
	Peripherals					
Q	ALLOY COMP	3	1	1.625	-0.3	-13.3
N	AM INTL INC	6	3	3.25	-0.1	-3.7
Q	AST RESH INC	18	7	17	2.1	14.3
Q	AUTO TROL TECH CORP	6	2	2.563	0.2	7.9
Q	BANCTEC INC	20	11	17.5	-0.3	-1.4
Q	CIPHER DATA PRODS INC	10	4	8.125	0.0	0.0
A	COGNITRONICS CORP	8	3	5.625	-0.6	-10.0
Q	CONNER PERIPHERALS	20	7	19.25	2.3	13.2
A	DATAPRODUCTS CORP	18	5	5.5	-0.1	-2.2
A	DATARAM CORP	13	8	12.875	0.5	4.0
N	EASTMAN KODAK CO	52	37	39	0.1	0.3
N	E M C CORP MASS	7	3	6.625	0.9	15.2
Q	EMULEX CORP	12	5	5.75	0.0	0.0
Q	EVANS & SUTHERLAND	30	17	28	0.0	0.0
Q	ICOT CORP	3	1	1.75	0.1	7.7
Q	INTERLEAF INC	10	5	6.125	-0.6	-9.3
Q	IOMEGA CORP	4	2	3.75	0.1	3.4
Q	LEE DATA CORP	4	1	1.688	-0.1	-3.5
Q	MASSTOR SYS CORP	4	1	1.813	0.2	11.6
Q	MAXTOR CORP	13	7	13.125	1.0	8.2
Q	MICROPOLIS CORP	8	3	4.875	-0.3	-4.9
N	MINNESOTA MNG & MFG CO	85	66	84.25	2.6	3.2
Q	PERSONAL COMP PRODUCTS INC	6	4	4.063	-0.2	-4.4
Q	PRINTRONIX INC	12	7	11.625	0.0	0.0
N	QMS INC	15	7	14.25	-0.6	-4.2
Q	QUANTUM CORP	17	5	14	1.1	8.7
N	RECOGNITION EQUIP INC	13	6	5.5	-0.9	-13.7
Q	REXON INC	9	6	9.25	0.5	5.7
Q	SEAGATE TECHNOLOGY	20	10	17.375	-0.8	-4.1
N	STORAGE TECH CORP	23	9	19.375	0.9	4.7
Q	TANDON CORP	2	0	1.688	0.2	12.5
N	TEKTRONIX INC	24	13	13.375	-0.1	-0.9
Q	TELEVIDEO SYS INC	1	0	0.219	0.0	-12.4
N	XEROX CORP	69	50	56.125	1.3	2.3
	Leasing Companies					
Q	AMPLICON INC	115	8	9.75	0.1	1.3
N	CAPITAL ASSOC INTNL INC	9	3	3.5	0.1	3.7
N	COMDISCO INC	34	21	26	-0.6	-2.3
Q	CONTINENTAL INFO SYS	2	0	0.281	0.0	-10.2
Q	LOI CORPORATION	18	13	16	1.3	8.5
Q	PHOENIX AMERN INC	5	3	3.625	0.1	3.6
Q	SELECTERM INC	9	6	5.875	0.0	0.0

EXCH: N=NEW YORK; A=AMERICAN; Q=NATIONAL

Low motion

Technology firms dip, pivot as investors drum up profits

How low can you go? Technology stocks limboed lower and lower last week as investors danced to the profit-taking beat.

Among those hit by the old soft-shoe was Oracle Systems Corp., which saw its shares dip to 24¾ on Thursday, down 1⅞ points. Also on the downside was Microsoft Corp. After reaching a new 52-week high early in the week, the No. 1 software maker lost 2¼ points by Thursday to finish at 111¼. The party was also over for Adobe Systems, Inc. as shares stumbled 4¾ points to 39½.

A few firms managed some fancy footwork, though, including Digital Equipment Corp., whose stock stepped up 2 points to 79½. Hewlett-Packard Co. whistled a happy tune as well, gaining 1½ points to 46⅝ after its announcement that New Wave stands for a hearty hello to industry standards as well as the name of its software. Ashton-Tate Corp. wiggled up ⅛ of a point to close Thursday at 13½. Monday's introduction of a new high-end Macintosh by Apple Computer, Inc. may have helped hustle stock prices up ½ of a point to 40¾. However, the unveiling of a new line of laser printers with Okidata Corp. did not seem to put any pep in IBM's step; its stock slipped 2⅛ points to 106½.

KIM S. NASH

NEWS SHORTS

CDC executive to join Commerce?

President Bush said last week that he will nominate Robert Marshall White to be undersecretary of commerce for technology, a new position. White, 51, has served as Control Data Corp.'s chief technical officer and vice-president for research and engineering since 1986. Earlier in his career, he held senior technical positions at Xerox Corp. White has taught or conducted research at Cambridge University, Stanford University, the University of California at Berkeley and Osaka University.

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Test-Piloting in Unix

Pilot Executive Software is about to begin beta testing an executive information system (EIS) that will operate under the Unix operating system. The company said its EIS development environment and its suite of EIS templates, including the EIS/G series of code-generating applications, will run on Hewlett-Packard Co.'s HP 9000 Series 800 computers under the HP/UX environment. HP/UX is compliant with AT&T's industry-standard Unix System V. The move will give Pilot the first major EIS to run under Unix, the company claimed. A spokesman for Pilot said the Unix EIS will be commercially available by late May or early June.

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Agway takes on Hood processing

Citing cost savings and convenience, H.P. Hood, Inc., a Boston-based dairy, citrus and food manufacturer, has moved all mainframe processing functions to Agway, Inc. in Syracuse, N.Y. Agway's Data Services division will handle data processing for Hood while the latter decentralizes its operations, a process estimated to take three years. Hood is moving to an IBM Application System/400 computing environment.

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Vitalink to route more protocols

Vitalink Communications Corp. will incorporate Touch Communications' Open Systems Interconnect (OSI) software in its Transpath bridges and routers in 1991 under an agreement signed last week. This is reportedly the first time Touch, which generally provides OSI-based products to systems integrators and large end users, has provided an internetworking company with its implementation of the OSI protocol stack. Vitalink also announced that, in addition to including OSI routing in its Transpath line, it will add routing for Digital Equipment Corp. Decnet, Government OSI Profile and Xerox Network Services protocols and will develop an X.25 network interface.

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Florida State buys supercomputer

The Supercomputer Computations Research Institute (SCRI) at Florida State University has a new addition: a $7 million-plus Thinking Machines Corp. Connection Machine R system. The configuration of the supercomputer, which is now up and running, includes 65,536 parallel processors and 2G bytes of main memory. SCRI, established in 1984 with U.S. Department of Energy support, conducts research programs in high-energy physics, geosciences and materials science. Florida State also recently added a Cray Research, Inc. supercomputer to replace an ETA Systems, Inc. box.

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Soft-Switch opens gateways

Soft-Switch, Inc. announced new X.400 gateways last week and said they support exchange of binary files and revisable files such as word processing documents over X.400-based networks. The Wayne, Pa.-based maker of electronic mail products said the ability to transmit binary files over X.400 nets is based on technical recommendations made by the National Institute of Standards and Technology (NIST), formerly the National Bureau of Standards. Soft-Switch said that U.S. Sprint's Sprintmail Service also follows the NIST recommendations and that the two companies hope to see the NIST approach adopted as an industry standard. Other companies expressing support include AT&T, General Electric Co. and Western Union Corp., Soft-Switch said.

Can RS/6000 outshine supers?

BY JAMES DALY
CW STAFF

LIVERMORE, Calif. — The new kid on the block in the workstation market has already started a shoving match.

Performance tests recently conducted by a computer researcher on IBM's fledgling RISC System/6000 workstation line indicate that the new system is faster than a Cray Research, Inc. supercomputer on specific scientific tests, opening a hornet's nest of debate on the future of high-performance computing.

University of California Lawrence Livermore National Laboratory researcher Eugene Brooks raised serious questions about the impending role of conventional supercomputers when he reported that IBM's Powerstation 530 performed up to 50% faster than a Cray Model X/MP 4/16 when running a pair of scalar processing applications. Scalar processing, a computational method in which numbers are processed one at a time, is typically found in applications such as operating systems.

"The show for scalar performance is essentially over; this is a first-class killer micro," said the researcher in comparing the $42,705 IBM machine with the $4 million Cray box. "IBM is delivering the same performance [as the Cray] at one one-hundredth the cost."

The RS/6000, which is scheduled to be available in May, is the first workstation built to a superscalar execution design, which permits the execution of as many as five instructions simultaneously. The model can also process 34.5 million instructions per second.

Cray prey

While Cray officials conceded that there was pressure in the scalar area, they said scalar tasks take up less than 1% of the Cray's processing demands. Manager of Benchmarking Charles Grassl said its machines derive their computational punch from vector processing, in which a single instruction is simultaneously executed on a list of numbers.

Such processing is frequently needed for problems that involve extremely long sets of calculations, such as computational fluid dynamics.

Brooks conceded that a vector processing test run at his laboratory between the two machines showed the Cray firmly in the lead.

Early indications of an impending narrowing of differences between the two product lines could have enormous implications for users and could further spur sales in the already sizzling Unix workstation market.

Observers said workstations are overtaking the performance of minicomputers and will continue their kudzu-like power creep into mainframe territory within the next few years.

Analysts warned, however, not to count out the supercomputer yet.

"We have at least a decade in front of us in which supercomputers will have a vital role to play," said Omri Serlin, a Los Altos, Calif.-based consultant and editor of the monthy "Serlin Report on Parallel Processing" industry newsletter. "But the advances in the performance level of micros has been quite astounding."

DG hustles to hold on to 6,000-unit fed deal

BY MARYFRAN JOHNSON
CW STAFF

WESTBORO, Mass. — Data General Corp. climbed back into the ring swinging last week after a federal agency derailed the largest government contract award in the firm's history.

In what a rival vendor called a "grandstand play to impress their stockholders," DG filed a notice of appeal asking the U.S. Court of Appeals in Washington, D.C., to overturn a ruling by the General Services Administration.

That ruling, by a GSA appeals board on March 15, upheld an SMS Data Products Group, Inc. protest against the awarding of the bid.

The disputed contract is for a nationwide computer network for the Department of the Interior, which is to be used mainly by the water resources division of the U.S. Geological Service. The Distributed Information System (DIS-II) network was to include more than 6,000 Aviion workstations and servers and could be worth up to $127 million over the next seven years.

"This contract belongs to us. We were improperly removed," said Bert Rosecan, president of SMS, a systems integration company offering Hewlett-Packard Co. workstations for the network.

In its ruling in favor of SMS' protest, the GSA board agreed that the McLean, Va., vendor had been improperly disqualified from the project.

With the federal court now involved, the interior department began last Friday to terminate DG's contract and reopen bidding for the "best and final offers" of the three finalists, federal contract negotiator Ronne Rogin said.

The three finalists are DG, SMS Data Products and Lockheed Corp.

Low bids

Although the government is authorized to spend as much as $127 million, the actual bid awarded to DG was in the $60 million range, Rogin confirmed. The SMS bid was the lowest of the three, she said, but she added that the company "didn't meet our requirements" when it came to software licensing.

The central point of contention is whether the software licensing should be unlimited or sold on a per-user basis.

"We don't know the number of users we will have, so although it's probably cheaper to [purchase licenses for each user], what we need is unlimited licensing," Rogin explained.

The contract negotiator said the government was also concerned that depite SMS' low bid, additional costs would be incurred in upgrading the older HP workstations that SMS proposed to use. "Their price might evaluate low but not end up being the lowest price," Rogin said.

The success of the Aviion line, DG's first set of reduced instruction set computing machines, is crucial to the company's future as it shifts away from its proprietary platform of Eclipse MV minicomputers to the Unix-based Aviion line.

The interior department's water resources division is replacing a network of Prime Computer, Inc. minicomputers and intends to use the new network for office automation, electronic publishing, geographic information systems and hydrologic applications.

"The Aviions are a good solid product, so it's not like the bid wasn't any good," said David Card, an industry analyst at International Data Corp. in Framingham, Mass.

This contract was important to DG in many regards, he added: "Not only was it a big contract to win, but it set DG in motion to bid for big federal Unix contracts."

IDC estimates that DG sold 700 to 800 Aviions — mainly workstations — in 1989, the product's first full shipping year. That amounts to $20 million to $30 million in Aviion business, Card said.

Internet interloper targets hacker critics

BY MICHAEL ALEXANDER
and ELLIS BOOKER
CW STAFF

It was high noon on the Internet computer network last week as an unidentified hacker with a "gunslinger mentality" set out to confront those who have castigated outlaw hackers for illegally breaking into computers.

The hacker successfully penetrated systems at Harvard University, Purdue University and Digital Equipment Corp. and attempted to enter several dozen others on the nationwide network, which links computers at research labs, universities and other sites.

John Martini
Purdue's Spafford

"It is somebody with a gunslinger mentality out to prove who has the fastest gun," said Clifford Stoll, an astronomer at Harvard's Smithsonian Center for Astrophysics.

The hacker also managed to penetrate a computer account belonging to Eugene Spafford, an assistant computer science professor at Purdue University noted for his research on computer worms and viruses.

"He is not a novice but a known, professional computer criminal," Spafford said. The hacker, apparently an Australian named Dave, is well known within computer and telecommunications security circles.

"There are aspects of the case that I have a legal obligation not to talk about because there may be a federal grand jury investigation and a trial." Spafford said. He added that the university notified federal law enforcement officers immediately after the first break-in was discovered.

U.S. Justice Department officials declined to confirm or deny whether the case is currently under investigation.

The trespasser accessed a Sun Microsystems, Inc. workstation at Los Alamos National Laboratory in Los Alamos, N.M., and used it as a springboard to other systems on the network.

Jim McClary, computer systems security officer for the integrated computing network at Los Alamos said "We weren't aware [of the intrusion] until we started getting calls from systems that this one was probing others."

The hacker also used the Los Alamos computer to run a decoding program on encrypted password files stolen from other systems, McClary said.

Harvard's Stoll

The break-ins from Los Alamos ended on Friday, March 16, when the laboratory's computer security team changed the Unix-based system's account codes and passwords.

This sort of break-in "doesn't happen with high frequency," McClary said. "But it's the kind of event we're going to have to expect on the open network."

Purdue University system administrators said they noticed the break-in almost immediately and began monitoring the hacker's attempts to probe computers. After watching the interloper's efforts for two to three weeks, they shut him out permanently, Spafford said.

Stoll said the hacker "had been breaking into computers for about a month [at Harvard], and we had been setting traps and monitoring his activities." Last Sunday, just as scientists at the center were preparing to permanently lock out the hacker, "somebody broke in and changed the computer banner to read, 'Have Cliff read his mail. The cuckoo has egg on his face,' " Stoll said.

The jibe was a reference to Stoll's book *The Cuckoo's Egg*, an account of his year-long quest to nab a gang of hackers who repeatedly rifled computer files at several sites on Internet in search of sensitive data that could then be sold to foreign intelligence agents.

The unidentified hacker telephoned Stoll last Tuesday to continue taunting him, Stoll said: "He said that he didn't mean any harm but that he was out to prove a point that not all hackers are bad."

The New York Times said last week it had been contacted by the apparent perpetrator, who said he attacked the systems in an attempt to embarrass those who have spoken disdainfully of outlaw hackers.

The intruder cracked passwords and deleted files to cover his tracks but did not destroy files or cause any damage to any of the systems he attacked.

His initial forays, which started about a month ago, were discovered almost from the beginning, and his activities had been under constant scrutiny since then, according to Stoll and others whose systems were hit.

"We know an intruder has been making persistent attempts on several dozen systems," said a spokesman at the Computer Emergency Response Team (CERT) at Carnegie Mellon University's Software Engineering Institute in Pittsburgh, which tracks computer security breaches on Internet.

However, the spokesman downplayed the significance of the incident and said intruders constantly attempt to enter Internet-attached computers.

Along with CERT, the Department of Energy's year-old Computer Incident Advisory Capability, based at the Lawrence Livermore Laboratory, is involved in the investigation.

Computer security on Internet remains relatively unchanged since Robert T. Morris, the former Cornell University graduate student, shut down thousands of computers with a worm program in early November 1988, said Ian Murphy, a self-styled professional hacker and president of IAM/Secure Data Systems, a computer security consulting firm in Philadelphia. "The impact of this incident may help to strengthen security in the areas of the attack, but the rest will remain in Wonderland."

Security

FROM PAGE 1

definitions, public relations liabilities and due-care considerations all contribute to this trend," Sherizen added.

Several experts agreed that the prospect of a serious computer security breach — one causing a company to go bankrupt or harming its employees or customers in some other way — is likely to increase.

Distributed information systems and the networks that interconnect them have made corporations more competitive, but at the same time, they have made them more vulnerable to attack by disgruntled employees, hackers and others, they noted. As computer systems are pushed out to end users, the responsibility for securing those systems is also distributed. That responsibility is not necessarily understood or readily accepted by end users, the experts said.

In the event of a computer-security breach that harms an individual or corporation, senior managers, officers and directors are someday going to be held responsible, he said.

According to Randall Miller, executive vice-president and general counsel at Compusource Corp., which markets disaster recovery services through its Hotsite division, a vice-president or manager of IS can be held personally liable for a catastrophic loss because of a data processing disaster if there are actions that he could have taken to prevent the loss but did not.

There have been numerous court cases in which disgruntled shareholders sued officers, directors and agents for alleged wrongdoing, he said. From these cases has come a standard called the "prudent man rule" that requires officers and others to discharge their duties with the diligence and care that ordinary, prudent people would exercise under similar circumstances.

However, there are no generally accepted standards of due care for the protection of computerized data, said Michael Agranoff, a Stafford Springs, Conn., attorney who specializes in computer law.

In other words. . .

"What this means in practical terms is that industry does not need to provide meaningful computer security, since it will almost certainly not be liable to persons injured as a result of unauthorized access to computerized data," he said.

Mandatory minimum standards for computer security are inevitable, according to Agranoff and several other experts. The issue is whether those standards will be adopted voluntarily by corporations or foisted upon them by force of law.

"Nothing will be done until there is a disaster such as a major corporation going to its knees — an airline, for instance — because of a computer security breach," said Robert Johnston, a manager in information security and business recovery planning at Andersen Consulting in Chicago.

John Martini
Data Security's Sherizen

"We're going to have a patchwork quilt approach to computer security until something like that happens," Johnston said.

A handful of states — Florida and California, for example — have recently passed legislation that would require state agencies to take measures to adequately protect their computer systems.

Some states also require insurance carriers to adhere to certain security guidelines, but the standards are not uniform and definitions vary widely, Johnston said.

The Computer Security Act of 1987 mandates that federal agencies take adequate steps to secure their computer systems and calls for the National Institute of Standards and Technology (NIST), with assistance from a 12-member panel, to develop computer security guidelines.

However, arguments between NIST and the National Security Agency over who has authority to establish computer security guidelines has stymied efforts to comply with the act, Agranoff added.

"The idea is that such standards and guidelines would permeate to the private sector, as Cobol standards did over 20 years ago," Agranoff said.

Industry needs the equivalent of the Department of Defense's trusted computer systems criteria, the so-called Orange Book, according to Willis Ware, a corporate research staffer at Rand Corp.

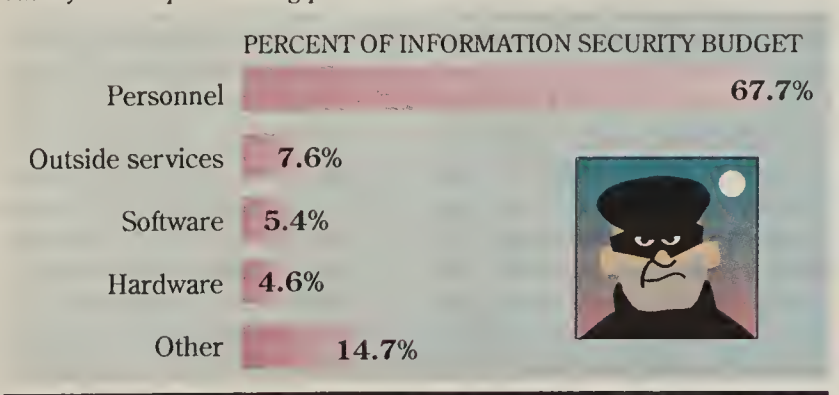
Ware, who heads the advisory board charged with assisting in formulating security standards, confirmed in a speech at the Information Systems Security Association conference in St. Louis last week that the board has made little progress.

"More progress has been made here in 20 minutes," he told the audience, "than in two years in Washington."

Next week, in the final part of this series, Computerworld *will look at computer crimes of the future and their impact on IS security.*

People are money

Security costs totaled 2.9% of the typical corporate budget in 1989, with the bulk of those expenses being personnel costs



Source: Computer Economics, Inc.
CW Chart: Doreen Dahle

Net clash

FROM PAGE 1

databases and shared applications such as Lotus Development Corp.'s Notes.

Several sources agreed that Unix — particularly AT&T's Unix System V, Release 4 — currently has a strong lead over OS/2 when it comes to integrated support of popular networking protocols.

However, Delmonte predicted that OS/2 will "give Unix a run for its money" in a couple of years — in plenty of time to be a candidate for the bank's long-term server platform strategy.

Other users cited a problem that should recede as the operating system matures: a lack of backward compatibility between recent versions of OS/2 and earlier versions of its counterpart, Microsoft Corp.'s LAN Manager network operating system.

"If you want to use the most recent version of OS/2 the day it comes out the door with an existing network operating system, you can't do it," said Bob Holmes, a computer technology research analyst at Southern California Gas.

OS/2's long-term networking strategy will become "clearer by the end of this year," when OS/2 2.0, the "real version," is scheduled to ship, Holmes said.

While vendors such as IBM, Ungermann-Bass, Inc. and 3Com Corp. have fitted OS/2 with a range of communications protocols, it will take time before different vendors' implementations learn to play in harmony.

No cakewalk

"We're finding out that it's not a cakewalk" to integrate and normalize inconsistencies among different vendors' implementations of LAN Manager and the various communications stacks underneath it, said Mark Teflian, vice-president and chief information officer at Covia Partnership.

"These things will be fixed, but it could take two years for commercial integration of important server tools, so we're doing it ourselves."

When Covia chose OS/2 Version 2.0 and LAN Manager as the new foundation for its LAN routing and application services, the airline service company knew that a lot of in-house programming would be needed to bridge current gaps in areas such as multivendor communications, administration and security, Teflian said. Covia is now leaning toward Unix as the basis for more powerful hubs that will serve the application and routing needs of entire regions, he added (see story page 1).

A senior engineer at a large Midwestern utility company, who has decided that his corporate direction for LANs is to implement OS/2 servers on 3Com Corp. 3+Open networks, conceded that Unix is "probably the better choice" for transaction processing environments demanding a high level of system reliability.

Not that OS/2 doesn't have its supporters. One advantage is said to be OS/2 Threads, which is designed to provide a resource-efficient environment for handling multiple on-line transactions. "People have been complaining about Unix's lack of threads," Teflian said.

There are smooth OS/2 LAN Manager installations that users are finding tough to criticize. Mike Drips, a systems analyst at United Data Services, has purchased OS/2 1.1 Standard and Extended Editions and is beta testing OS/2 1.2 Extended Edition from IBM with Microsoft's LAN Manager Version 2.0. OS/2, according to Drips, blends the "real-world" business applications found in DOS with the multitasking benefit of Unix.

With OS/2 on a LAN, "We can run four mainframe sessions, cut and paste between the mainframe and the desktop and do interprocess communication," Drips said. "I'm having no problems."

Take your pick

For some users, the choice between Unix and OS/2 as server platforms has little to do with the operating systems' networking or file-sharing functionality. Instead, users are choosing on the basis of the following:

- **Pre-existing server installations.** For Covia Partnership, OS/2 was a logical step from an internally developed multitasking version of MS-DOS, which had been the basis for a communications and applications server platform that Covia developed in-house approximately five years ago.
- **Pre-existing workstation installation.** The U.S. Navy, for example, has sent out a request for proposal (RFP) that does not specifically ask for OS/2 servers but does specify "a LAN that can support existing government-owned workstations, including OS/2 workstations," a Naval Acquisition spokesman said. The only way to meet that specification is with an OS/2 server that supports Named Pipes, according to David Linthicum, a systems manager at Sysorex Information Systems, Inc., a systems integrator that has responded to the RFP.
- **Support of specific types of hardware platforms.** Covia is currently leaning toward Unix for a "second-tier" server architecture now being selected because, unlike OS/2, the operating environment will support fault-tolerant computers from Stratus Computer, Inc. and Tandem Computers, Inc., as well as powerful Intel Corp. 80386- and 486-based machines.
- **LAN software preferences.** One user said, "Our decision was not one of Unix vs. OS/2. We took the approach that, based on a given PC LAN, which LAN server should we use?"

Covia

FROM PAGE 1

concentrated in a geographic region, such as San Francisco Bay, "95% of whose information needs can be handled by a single server," Teflian said.

The hubs would reside on the second level of Covia's three-tier server architecture, between the big hosts handling the databases and heavy processing of the large reservation and airport applications and the OS/2 servers residing on individual LANs.

These regional servers will potentially provide several advantages to Covia and its customers, Teflian said. First, the hubs could act as regional communications concentrators, which would eliminate the need to set up a series of individual connections between sites, each supporting a different communications protocol.

Second, unlike the smaller LAN servers, the hubs would have the power to offload critical applications from the big, level one hosts.

A related benefit is that it will be far more economical to implement and manage data integrity and security facilities at a few regional hubs than across a much greater number of widely distributed servers and gateways, Teflian said.

Finally, by providing shared applications and data across multiple user sites, hubs would end the need for maintaining and managing many redundant versions of the same records, Teflian added.

Covia's Teflian *goes regional with servers*

Covia has pretty much decided that an IBM 370 mainframe's architecture is unsuitable for the hub job, he said. One advantage of using OS/2 as the hub's operating environment is that it would allow Covia to "push up to the larger-scale server" a suite of communications server applications it originally developed five years ago for a proprietary multitasking version of MS-DOS, and is now porting to OS/2 and LAN Manager, Teflian said.

Unix was not chosen for this first server platform, he said, because at the time, it did not support such key communications protocols as Netbios and token-ring or host access protocols such as IBM's LU6.2.

However, Unix has since remedied many of its communications omissions. And OS/2 has one big drawback as a hub operating system, Teflian said: The machines it runs on today "are not architected with enough integrity, security, cycle time" to ensure acceptable reliability and response time for critical applications and routing functions.

In contrast, a Unix-based platform would allow Covia to develop services and applications that could run both on powerful Intel Corp. 80386 and 80486 microprocessor platforms and on fault-tolerant systems coming out from vendors such as Stratus Computer, Inc. and Tandem Computers, Inc., according to Teflian.

Keeping up to snuff

Users ask, vendors answer.

A burgeoning server market may be the reason there have been so many networking-related announcements in the OS/2 and Unix arenas during the past few months.

Highlights include the following:

Support of popular networking protocols:

January: AT&T announced that Unix System V, Version 4 will have embedded in it Transmission Control Protocol/Internet Protocol (TCP/IP), Sun Microsystems, Inc.'s Remote Procedure Call (RPC) and Network File System, and Open Systems Interconnect (OSI) at an unnamed future date.

January: IBM announced TCP/IP support for OS/2. Other vendors began announcing TCP/IP products for OS/2 about a year ago.

February: IBM announced its intent to support OSI on AIX, having already announced that OS/2 would support OSI.

Links into popular network operating systems and architectures:

September 1989: Hewlett-Packard Co. shipped LAN Manager for Unix (LM/X) to Microsoft Corp. for distribution to OEMs.

February 1989: Novell, Inc. announced Portable Netware, which supports Unix. An OS/2 version of Netware has not been announced yet.

Links into client/server architectures:

February: Digital Equipment Corp. announced that OS/2 will be able to act as a client or server for its Network Application Service. DEC has not made a similar announcement for Ultrix.

February: IBM announced that AIX/6000 will support LU6.2, with intent to support the protocol on other AIX systems.

Support of distributed computing:

Fall 1989: Vendor alliances responded to Open Software Foundation's formal request for proposals to build a standardized distributed computing environment that would support Unix and other operating systems. A time frame has not been given for delivery of such an environment.

October 1989: Sun, Netwise, Inc. and Novell announced a portable version of Sun's RPC, which will run on LAN Manager as well as other environments. Sun's RPC already runs on Unix.

Support of popular network management protocols:

February: IBM announced that AIX will support Simple Network Management Protocol (SNMP), both as a monitoring platform and as a service point to Netview.

Fall 1988: IBM announced an OS/2 version of Netview/PC.

October 1989: Sun announced Sunnet Manager, a Unix-based workstation that supports SNMP now and will support OSI and possibly other protocols later.

January: HP announced Openview Network Management Server, an HPUX-based SNMP network management workstation that should eventually run on other types of Unix and support OSI, HP said.

ELISABETH HORWITT

Kodak won't push LAN plans

BY ELISABETH HORWITT
CW STAFF

ROCHESTER, N.Y. — Eastman Kodak Co. remains on schedule with its strategy of moving critical applications down from the mainframe to local-area networks by the year 2000.

However, the manufacturer is still at the pilot stage of its LAN project and a long way from settling on specific vendor products to support its strategy.

A prototype human resources LAN system, which Kodak began implementing early last year on a 3Com Corp. OS/2 server, has been put on hold while IS ascertains how to provide users with "boutique-type information" via a link between the LAN and a recently implemented mainframe-based payroll system, according to Henry Pfendt, Kodak's director of information technology services.

Kodak's Pfendt

Kodak is about six to nine months into the implementation of a pilot project in Spain, which involves moving customer service applications for filling orders and doing billing from an IBM System/36 down to an IBM Personal Computer LAN, Kodak spokeswoman Jean Eason said.

The company plans to evaluate the Spain pilot nine months to one year down the road, with an eye toward migrating the PC LAN applications to business environments much larger than the Kodak site in Spain, Pfendt said.

The choice of actual LAN hardware and software products will have to wait while Kodak's business systems organization does a "complete re-engineering of fundamental business processes" and evaluates how LAN technology can support those redesigned processes, Pfendt said. IS is already beginning to do such an evaluation at one U.S.-based business unit, he added.

Kodak will also need time to work out several key organizational issues, particularly how much of the support, maintenance and management functions to decentralize at the actual business units where LANs reside and how much to centralize at the IBM-operated centers, Pfendt said. "What we would like to have is decentralized operations with centralized control" of critical functions such as backup and recovery, he added.

Kodak expects, at least initially, to keep basic LAN administration and support functions the responsibility of the autonomous business groups, Pfendt said, adding that he does not expect to see the technology "to manage multiple LANs in an $18 billion multinational corporation" for at least three to five years.

Kodak's LAN migration effort is unlikely to diminish IBM's responsibility for managing and supporting the manufacturing firm's data centers, because the mainframes' role will not diminish, Pfendt said. While Kodak wants to move the bulk of operations and office applications down to LANs, the mainframes will continue to handle central database files, network management, corporatewide message routing and "computer- and image-intensive applications that require a mainframe environment," he added.

Kodak plans to work with all of its outsourcing partners — IBM, Businessland and Digital Equipment Corp. — to address those organizational issues.

HP brings Unix, graphic product plans into view

BY J. A. SAVAGE
CW STAFF

Following up its January announcement that it would market a Unix-based fault-tolerant computer using technology from Sequoia Systems, Inc., Hewlett-Packard Co. last week said the system is now available.

HP also announced graphics technology using the new Intel Corp. I860 as a coprocessor and revealed the first step in a strategy to allow its New Wave software to run on the Unix operating system as well as its current host, DOS-based Microsoft Corp. Windows.

The fault-tolerant machines are only slightly different from Sequoia's current offerings, with some fine-tuning in software such as network communications system ports, which would appeal to the telecommunications industry, said Andy Ingram, marketing manager for HP's fault-tolerant operation.

Pricing, however, is about 5% to 15% higher than comparable Sequoia systems.

The HP Model 1240 is based on Motorola, Inc.'s 68030 processor and can be configured with up to 64 processors. The performance is rated at 20.9 transaction/sec. per processor, according to HP.

The I860-based graphics technology will increase the processing speed and clarity of workstation graphics, HP said. The products, due by the end of the year, would use HP's own architecture and multiple I860 coprocessors. Each I860 has a peak rating of 40 million instructions per second and 80 million floating-point operations per second, according to the organization.

New Wave on Unix

HP also said last week that it will offer a graphical user interface called Visual User Environment (VUE) for HP computers running the Unix operating system. VUE, scheduled for availability in August, resembles the company's New Wave application interface.

It is not yet New Wave on Unix, according to the company, but New Wave capabilities can be added to the VUE shell.

New Wave consists of a graphical user interface, applications development capability and the facility to access standard and proprietary platforms.

3Com may find catching up hard to do

BY JIM NASH
CW STAFF

WASHINGTON, D.C. — 3Com Corp.'s introduction of new wide-area bridge and brouter products may signal a shift in emphasis away from work-group systems and toward enterprisewide computing. However, for at least two information systems professionals, the company is playing an unconvincing game of catch-up.

Officials at the Santa Clara, Calif.-based company announced the introduction of its Internetwork Bridge/3000 and the Brouter/3000 with a flourish. The bridge/router, or brouter, can operate as a three-protocol (Transmission Control Protocol/Internet Protocol, Xerox Network Systems and Open Systems Interconnect) router, an internetwork bridge or a brouter that bridges all other protocols, according to 3Com.

The bridge is priced at $7,495; the brouter has a price tag of $7,995.

3Com's move is being billed as a renaissance or, as Chief Executive Officer William Krause put it, "a restart as we get back into this business." Krause said the products, which are part of 3Com's Netbuilder product line, are the first visible results of 3Com's merger with Bridge Communications three years ago.

Users, however, do not appear ready to rush 3Com's doors for the products. Marc Malacoff, manager of technical support for M. W. Kellogg Co. in Houston, said his department has moved away from its almost exclusive relationship with 3Com. The announcement, Malacoff said, is 3Com's bid in a game of catch-up.

He said he is "fairly happy" with the Vitalink Communications, Inc. and Retix Corp. bridges that are connecting networks in Louisiana and at other Texas sites.

Malacoff criticized 3Com's lack of technical support, citing cooperative marketing agreements offered by Vitalink that include maintenance contracts 3Com does not offer.

Jack Covert, a scientist at the communications and data processing division of Hughes Aircraft Co. in Long Beach, Calif., was equally unimpressed with the announcement.

"They [3Com] fit right in there with the rest of the group," Covert said, referring to Cisco Sytems, Vitalink, Retix and other brouter firms. 3Com's new products appear to match the capabilities of most bridge and brouter devices, he said; only with its prices does 3Com stand out. He said they were "competitive" but not enough to woo him away from his department's Vitalink devices.

According to Covert, bandwidth exceeding T1 might lure Hughes, but like other major manufacturers, 3Com's products cannot break that limit.

National Correspondent Mitch Betts contributed to this report.

Sterling finally wins out on tossed-out NASA contract

BY JEAN S. BOZMAN
CW STAFF

PALO ALTO, Calif. — Sterling Software, Inc.'s Federal Systems group clung to a NASA contract by its fingernails last week — and managed to hold on. At stake was roughly 20% of Sterling's $180 million revenue stream.

A federal administrative judge ruled that a contract that NASA had twice awarded to Sterling competitor Computer Sciences Corp. (CSC) in El Segundo, Calif., was invalid. Sterling Federal Systems and its corporate predecessor, Informatics, have developed software for NASA's Ames Research Center and operated its supercomputer data center since 1969.

Sterling Federal Systems had fought an 18-month appeal to retain the contract, awarded to CSC on the basis of lower cost in November 1988 and again in October 1989. "We feel we have been vindicated," said Geno Tolari, president of Sterling Federal Systems. "And, despite the lengthy appeals, none of the work was interrupted."

In his ruling, Federal Administrative Judge James W. Hendley said CSC had deliberately understated the salary levels of those who would head up the Ames software-development project. NASA, Hendley said, "was wearing blinders to a contractor's misrepresentations [and] sought to ignore the situation."

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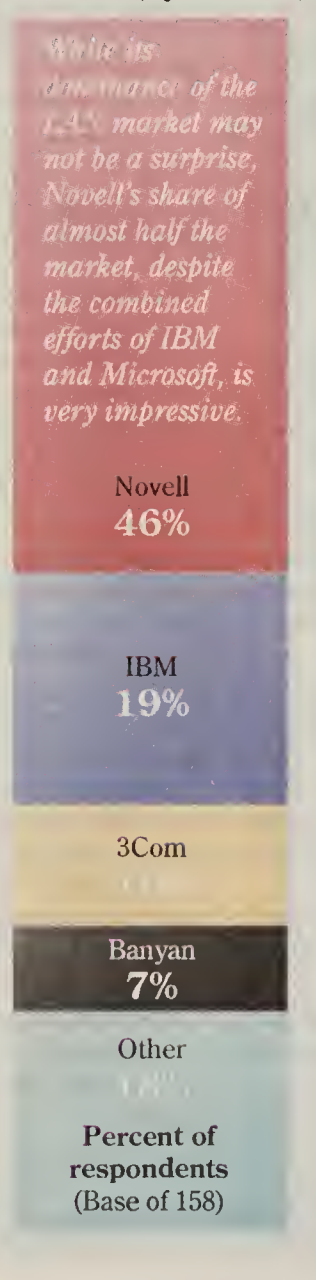
TRENDS

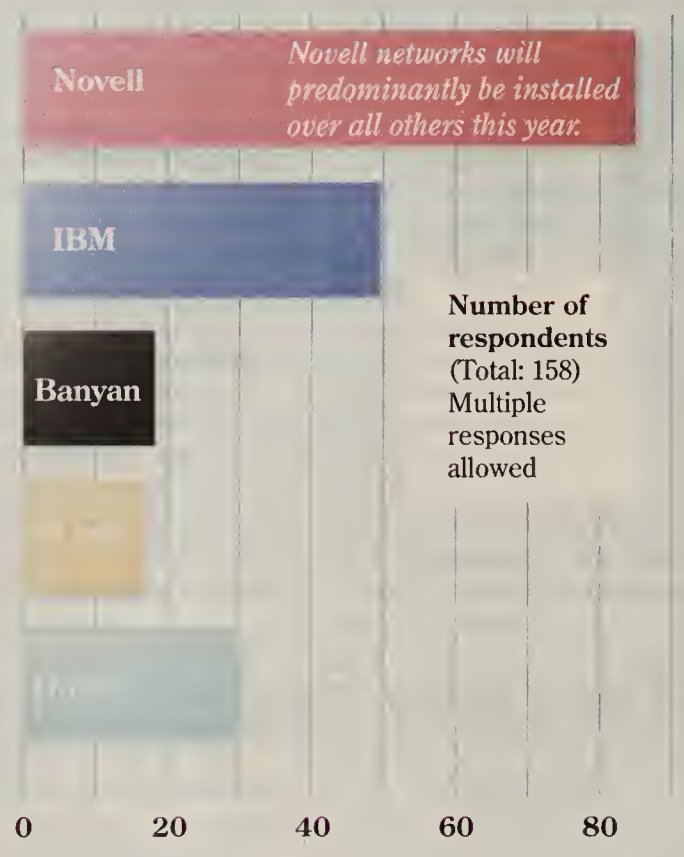
LANS

In the LAN neighborhood, the big guy on the block is still named Novell, and it doesn't have any plans to move in the near future

Type of network installed (by vendor)

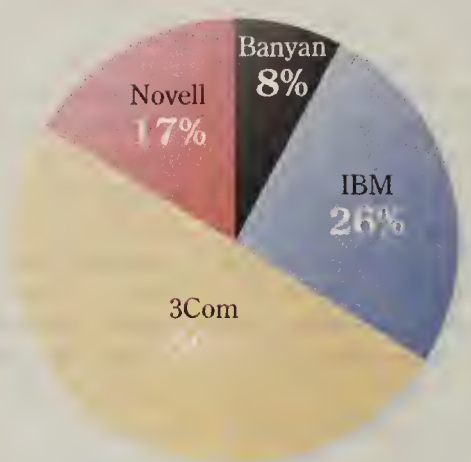


1990 installation intentions (by vendor)



Percent of users changing LAN operating systems in 1990

Those not planning to change operating systems are generally those who are most satisfied. Thus, those utilizing Banyan are the most satisfied, while 3Com users are the least satisfied.



Source: Bear Stearns & Co./Goldstein Golup Kessler & Co., P.C., New York
CW Charts: John York

INSIDE LINES

What goes around, comes around

The Computer Emergency Response Team at Carnegie Mellon University regularly sends out advisories on software patches and security breaches as well as other information to subscribers on its Valert-L electronic-mail hot line. About three weeks ago, it also inadvertently sent out a virus to some 800 subscribers on the mailing list, according to one of CERT's coordinators.

A Toon Town fantasy

Apple insiders say the low-cost Mac (under $1,000) being worked on deep within the bowels of the company will use the same modular design as the Mac SE. However, producing a color version has been tough because the color tubes are so large. The first color prototype, said one engineer, "wound up looking like a giant forehead."

No worry when the boss steps aside

Charles Darnell, the colorful IS chief at Conyers, Ga.-based Lithonia Lighting, said he plans to retire in three years at age 55 and go into consulting. He said his successor will be second-in-command Jeff Kernan, who joined Lithonia from Pitney-Bowes three years ago as vice-president of information and management services. Darnell has spent his entire 26-year IS career at Lithonia.

Veni, vedi, virus?

According to a top IS security exec at Rockwell International, viruses that target Apple Macintoshes are increasing dramatically and now account for 50% of virus attacks — even though the Macs amount to only 10% of the company's installed base of 20,000 personal computers. "It used to be that viruses hit one, two or three PCs once a month; now it's 40 to hundreds, several times a month," he said.

Bring rotten fruit

Calling all disgusted LAN managers: On April 5, the Hartford Holiday Inn will host the first meeting of the Council for Network (soon to be LAN) Management — or "Veterans of LAN disasters singing the LAN blues," according to Aetna's Rick Segal, one of the group's founders. The council's dual goals are to prod vendors into providing effective LAN management products and to "get the damn Coke cans off the file servers" — that is, help LAN managers avoid making the same old mistakes, Segal said.

Games companies play

The answers being bandied about last week centered on Western Digital, Seagate Technology and an Asian entry — Acer — but, at week's end, the question of which three companies were reportedly bidding to buy beleagured disk drive vendor Miniscribe out of Chapter 11 was left hanging. The name of the guessing game sparked by Miniscribe Chairman Richard Rifenburgh's refusal to specify firms and terms is *Jeopardy!*, real-life style: Under current court orders, Miniscribe's assets will be auctioned off by a bank if no buyer materializes by next Wednesday.

'You maggots wanna wear pinstripes?'

DEC is reportedly putting an elite corps of high-powered sales folks through two five-week-long "boot camps" where the prevailing theme is, "You're not as good as IBM!" With ex-IBMers conducting sessions from dawn till dusk, the high-stress training actually requires participants over 40 years old to get a doctor's permission before attending, according to one trainee. The final exam? A hard-nosed simulation in which each sales representative must penetrate a Big Blue account and sell something.

How about building a hackers' network for the clowns to play around on and spending the saved manpower lobbying state and federal legislators for effective and stringent security laws and punishments to protect commercial and academic networks? If you've got a workable solution to the crime wave, pass them on to News Editor Pete Bartolik via fax (508-875-8931), phone (800-343-6474) or MCI Mail (address: COMPUTERWORLD) and we'll provide the forum.

NEXT WEEK

At General Dynamics, the best defense against waste and missed deadlines is a strategy that unites design and manufacturing. Automating the factory floor isn't enough, says **Lou Piper,** chief CAD/CAM engineer at the Data Systems Division; it takes integration of planning and production to ensure manufacturability. See Executive Report.

Alan Levinson

Entrepreneurs are not just born, they can be made. With the right attitude, some economic know-how and market savvy, you could be on your way to becoming the next H. Ross Perot. For more detailed instructions on how to become an empire-builder, check out David Bernard of the Wharton School in the In Depth section.

Our systems are up. So log in.

Bring us your computer language skills, a talent for communication, and the desire to do something important, and we'll give you an opportunity to make a significant contribution.

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So check out the opportunities. If your skills and experience match our requirements, get in touch.

Here's What We Need

The following positions require appropriate industry experience. A degree in CS, EE or ME is desired. Talented entry level engineers and computer specialists with advanced degrees will also be considered.

Applications:
Financial, Manufacturing, Engineering, Logistics, Embedded Software, Expert Systems, CAD/CAM, Neural Networks, Scheduling Systems

Software Packages:
CATIA, McCormick-Dodge, Microsoft Windows, CASE Tools, X Windows, Powerhouse/Trans Act, Artemis, FOCUS

Hardware:
IBM, CRAY, HP, DEC/VAX, Apollo, SUN, TANDEM, WANG/VS

Communications:
LAN, Network Architecture, Novell, X.25, MAP/TOP, Ungerman Bass, Cable Plant Engineer, Protocol Layer Evaluation/Design, Network Hardware

Language Experience:
Ada, C, COBOL, FORTRAN, PL/1, SQL, Pascal, Assembler/BAL, 4GL, C++

Operating Systems:
MVS, UNIX, CICS, DOS, VMS, NOS, CDS

Database Experience:
IMS, DB2, Microrim, Ingres, Paradox, ORACLE

Software Engineering Skills:
Data Modeling/Data Management, DOD Standard 2167, System Architecture, Software Testing, Systems Engineering, Capacity Planning/ Performance Tuning, Integration Engineering, Project Management

Operating Systems Analysts:
Experience in operating systems of IBM, Digital (8000 series) and HP (3000 and Spectrum series) required.

Factory Automation Software Development:
Integrated OSI communications (MAP/TOP), manufacturing and business operations in a CIM environment which makes exclusive use of multi-vendor platforms (Digital, HP, Intel, LAN & WAN systems).

IMS Programmer Analysts:
Experience designing, coding and implementing on-line and batch business systems in an IBM mainframe environment. Proficiency in COBOL, IMS DB-DC, JCL, and TSO/ISPF required. Knowledge and experience with Micro Focus Workbench a plus.

IMS Database Administrators:
Command of all IMS database-related functions. Performance analysis, space management, problem resolution and logical/physical database design skills are essential.

IBM 8100 Programmer/Analyst:
Requires proficiency in use of IBM 8100 hardware and software products. Desirable experience includes DPPX/SP operating system, DPPX/COBOL, DTMS, TSO, CLISTS, host communication facilities and structured programming.

Programmer/Analyst:
Programming experience using Tandem computers, knowledge of COBOL, SCOBOL, DDL, Inspect, Enable, TMF, Structured Methods, CASE Tools, and Pathways required. SQL and TAL background a plus.

Operating Systems Programmer:
Internals experience in one or more of UNIX, MVS, VMS, NOS, or COS operating systems. Ability to solve system dumps and design new operating system products required.

Here's What We Can Do For You

These positions offer excellent growth potential along with the right salary, relocation assistance and these benefits:

- Company-paid Plans for Health Care, Vision, Dental, Retirement
- Company-sponsored Training Programs (on/off hours)
- Investment Plans (VIP/FSP)
- Continuing Education Program (reimbursable)
- Employee Suggestion & Cost Improvement Programs

We can offer you another plus—a chance to share a quality lifestyle in the beautiful Pacific Northwest. Near Seattle, the number-one ranked city for recreation, and one of the nation's most livable cities, as well.

Here's How To Get In Touch

If you have what it takes to make our team, please send your resume, with current and expected salary, to *Boeing Employment Office, P.O. Box 3707-PDA, Seattle, WA 98124.*

Or fax your resume, in strictest confidence, to our 24-hour fax line: 1-800-525-1036. Principals only.

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